2016 Kansas Integrated Water Quality Assessment

Arkansas River near Wichita, May 2013

Kansas
Department of Health and Environment
Division of Environment

March 30, 2016
Bureau of Water
KDHE Division of Environment
1000 Southwest Jackson Street, Suite 420
Topeka, Kansas 66612-1367

This page intentionally left blank.

TABLE OF CONTENTS

List of Tables 5
List of Figures 6
Executive Summary 7
Part A: Introduction 9
Purpose 9
General Assessment Approach 9
Organization of Report 9
Part B. Background 11
Total Waters 11
Water Pollution Control Program 11
I. Point Source Pollution Control 11
II. Nonpoint Source Pollution Control 13
Cost/Benefit Assessment 18
Special Concerns and Recommendations 19
I. Agricultural Concerns 19
II. Municipal and industrial concerns 21
III. Nuisance aquatic species 22
IV. Variation In Flow Regimes 23
V. Conclusions 24
Part C. Surface Water Monitoring and Assessment 27
Monitoring Programs 27
I. Targeted Stream Chemistry Monitoring Program 27
II. Targeted Stream Biological Monitoring Program 28
III. Probabilistic Stream Monitoring Program 29
IV. Targeted Lake and Wetland Monitoring Program 31
V. Fish Tissue Contaminant Monitoring Program (Targeted and Probabilistic) 33
VI. Subwatershed Monitoring Program 33
VII. Compliance Monitoring Program 34
VIII. Special Projects 35
Assessment Methodology 36
I. 305(b) Assessment Methodology for Streams 36
II. 305(b) and 314 Assessment Methodology for Lakes and Wetlands 40
III. 303(d) Assessment Methodology 41
Assessment Results 43
I. 305(b) Assessment Results for Streams and Rivers (Probabilistic Data) 43
II. 305(b) and 314 Assessment Results for Lakes and Wetlands 49
II. 303(d) Assessment Results 61
Public Health Issues 61

I. Drinking Water Use 62
II. Beach Use (Blue-Green Algae and Algal Toxins) 63
III. Fish Consumption 64
IV. Other Considerations 65
Part D. Groundwater Monitoring and Assessment 67
Overview 67
Groundwater Monitoring by Other Agencies 67
Groundwater Monitoring by KDHE 68
Groundwater Monitoring associated with Public Water Supply Systems 74
Part E. Public Participation 77
Sources Cited 78
Appendices 82
Appendix A. Routine and Supplemental Parameters 82
Appendix A-1: Water Chemistry Parameters 82
Appendix A-2: Fish Tissue Parameters 86
Appendix B. 303(D) LIST 87
Appendix B-1: Currently impaired waters 88
Appendix B-2: Previously impaired waters, now in Category 2 151

LIST OF TABLES

Table 1. Geographic information on the total waters of Kansas 11
Table 2. Number of active KWPC and NPDES permits as of January 1, 2016 12
Table 3. Permit compliance for discharging wastewater treatment facilities, 2012-2013 13
Table 4. KDHE cooperative funding for construction and expansion of municipal wastewater treatment facilities. 19
Table 5. Types of data applied to assessment of designated use support for streams and rivers, 2010-2014 36
Table 6. Aquatic life use non-support thresholds for biological metrics across three stream classes 38
Table 7. *Escherichia coli* criteria used in recreational use assessments 39
Table 8. Mean chlorophyll-a thresholds used as support criteria for six designated uses 40
Table 9. Probabilistic stream assessment fact sheet 44
Table 10. Allocation of designated uses among classified streams 45
Table 11. Support of individual designated uses in streams (in miles) 45
Table 12. Detailed account of use support for streams (in miles) 46
Table 13. Major causes of water quality impairments in streams (in miles) 46
Table 14. Major sources of water quality impairments in streams 47
Table 15. Categories of data used in ALUS assessments for lakes (in acres) 50
Table 16. Summary of Fully Supporting, Threatened, and Impaired Lakes 50
Table 17. Individual use summary for lakes (in acres) 50
Table 18. Total lake area impacted by various cause categories (in acres) 51
Table 19. Total lake area impaired by various source categories (in acres) 52
Table 20. Lakes with identifiable point and nonpoint source pollution contributions 52
Table 21. Trophic status of lakes during this reporting cycle 54
Table 22. Trophic state trends in lakes 55
Table 23. Individual use summary for wetlands (in acres) 59
Table 24. Total wetland acres impacted by various cause categories (in acres) 59
Table 25. Total wetland acres impacted by various source categories 59
Table 26. Trophic status in wetlands 60
Table 27. Trophic state trends in wetlands 60
Table 28. Summary of 2014-2015 spill events 65
Table 29. Summary of fishkill events investigated by KDHE 2014-2015 66
Table 30. Summary of state groundwater protection programs 70
Table 31. Major sources of groundwater contamination for Kansas 72
Table 32. Groundwater contamination: statewide cumulative summary through December 31, 2015 73
Table 33. Results of groundwater monitoring associated with Public Water Supply Systems, 2012-2014. 76

LIST OF FIGURES

Figure 1. Kansas WRAPS Projects as of December 2015 15
Figure 2.Targeted Stream Chemistry Monitoring Program Sites 27
Figure 3.Targeted Stream Biological Monitoring Program Sites 28
Figure 4. Probabilistic Stream Monitoring Sites, 2010-2014 30
Figure 5. Targeted Lake and Wetland Monitoring Sites 32
Figure 6. Percent land area of Kansas affected by drought 2010-2014 48
Figure 7. Aquatic macroinvertebrate community status, shown by sample year 48

EXECUTIVE SUMMARY

This report, the Kansas Integrated Water Quality Assessment (2016), was prepared by the Kansas Department of Health and Environment (KDHE) in response to water quality reporting requirements contained in sections 303(d), 305(b), and 314(a) of the federal Clean Water Act (CWA). Section 303(d) calls for the development of a list of waterbodies currently failing to meet established water quality standards, whereas sections 305(b) and 314(a) require information concerning the overall status of the state's surface waters and the programs responsible for water quality monitoring and pollution abatement.

The Kansas 2016 list of impaired waters (*i.e.*, 303(d) list) is included as an appendix to this report. This list is based primarily on data collected by the KDHE targeted surface water monitoring programs and secondarily on information obtained from outside sources. For this assessment, watersheds containing targeted stream chemistry and/or stream biological monitoring stations represented the assessment units for flowing waters. Monitored lakes and wetlands represented the assessment units for standing waterbodies. The state's 2016 303(d) list identifies 500 station/pollutant combinations of water quality impairment on lakes, wetlands, and stream systems (watersheds), encompassing 2521 stream segment/pollutant combinations, and needing the development of Total Maximum Daily Load plans (TMDLs) to address the offending pollutants. The 2016 list also identifies 467 station/pollutant combinations of waters that were previously cited as impaired in prior lists but now meet water quality standards, with 11 of these being new in 2016.

Requirements related to Section 305(b) were addressed, in part, using data obtained through a stream monitoring program implemented in 2006. This program employs a probabilistic survey design to estimate the stream mileage supporting those uses recognized in section 101(a) of the CWA: aquatic life support, food procurement, and contact recreation. The program's target population for monitoring and assessment included all classified streams that contained water during the summer low-flow periods of 2010-2014. Owing largely to climate variation during this assessment window, only about 64% of the state's classified stream mileage was represented in the target population for assessment. Lake and wetland assessments for Section 305(b) as well as Section 314 reporting requirements were addressed using data from the targeted lake and wetland program, which uses a near-census approach in its monitoring.

Monitoring data obtained during this reporting cycle indicated that approximately 23% (± 7%) of the state's designated stream mileage fully supported all three section 101(a) uses, whereas 77% (± 7 %) was impaired for one or more uses; parenthetical values represent 95% confidence intervals. Aquatic life, contact recreation, and food procurement uses were supported, respectively, in 35% (± 6%), 90% (± 4%), and 49% (± 9%) of the stream miles designated for these uses. The two major measures ("causes") demonstrating non-support for streams were suboptimal aquatic macroinvertebrate community metrics, which is an indicator of aquatic life support, and mercury in fish tissue, which is an indicator of food procurement use. Presence of contaminants such as metals, pesticides, and bacteria comprised a fourth category of causes. The most widespread discernible sources responsible for use impairments and/or pollutant loadings were generalized anthropogenic influences (*e.g.*, eutrophication, erosion and sedimentation, atmospheric deposition of contaminants), followed by agriculture (both crop and livestock

production), and other sources (including natural sources and unknown sources). Urban influences (both point and nonpoint sources) were less widespread, an unsurprising result given the ratio of urban to rural land use in Kansas.

Approximately 3% of the assessed lake acreage fully supported all designated uses, whereas 97% was impaired for one or more designated uses. Approximately 75% of wetland acreage was assessed. Of this population, less than 1% fully supported aquatic life and recreational uses. Major causes of impairment in lakes and wetlands included nutrient enrichment, siltation and turbidity; and zebra mussel (*Dreissena polymorpha*) infestations. Agriculture, municipal point sources, resuspension of sediments, and non-native species introductions were the primary sources of these impairments. Approximately 51% of the assessed lake acreage exhibited no recent change in trophic condition, 40% experienced a measurable deterioration in trophic state, and about 3% exhibited some improvement in trophic condition (with 6% unknown).

Kansas experienced some flooding in 2010 followed by significant and extended statewide droughts in 2011-2013; 2014 marked the beginning of drought recovery. The combined effects of these dramatic weather-related events doubtless exacerbated many of the water quality impairments documented in the past decade.

PART A: INTRODUCTION

Purpose

This document fulfills specific water quality reporting requirements placed on the State of Kansas by sections 303(d), 305(b), and 314(a) of the federal Clean Water Act. Sections 305(b) and 314(a) require a summary of the status of the state's surface waters. Section 303(d) calls for development of a list of waterbodies currently failing to meet established water quality standards, which are regarded collectively as "impaired waters." Kansas is required under the CWA to take actions that improve the condition of impaired waters. These actions may include the development and implementation of TMDLs, water quality-based permit requirements, and/or nonpoint source (NPS) pollution control measures. This report presents an integrated response to the requirements of sections 303(d), 305(b), and 314(a) and contains information relevant to upcoming water quality planning, monitoring, permitting, and pollution abatement initiatives in the state.

General Assessment Approach

KDHE administers several programs that collectively satisfy the environmental monitoring and reporting requirements of the CWA (KDHE 2010). These programs also provide the technical data needed to respond to existing and emerging water pollution problems. Departmental monitoring operations currently focus on the condition of the state's surface waters (rather than groundwater) and involve two different but complementary conceptual approaches. The first involves a targeted survey design that focuses on selected stream reaches, lakes, and wetlands. The second approach involves a probabilistic survey design that assesses randomly chosen stream reaches and extrapolates the monitoring results to the entire population of classified streams in the state. Targeted monitoring operations accommodate the development and refinement of the Kansas 303(d) list, whereas both targeted and probabilistic data are needed to meet section 305(b) and 314(a) reporting requirements.

Within KDHE, activities related to sections 305(b), 314(a), and 303(d) sections of the CWA are performed by the Watershed Planning, Monitoring, and Assessment Section of the Bureau of Water (BOW). Portions of this report addressing sections 305(b) and 314(a) characterize the overall condition of the state's streams, lakes, and wetlands and report on the prevalence of bioaccumulative contaminants in fish. They also describe the major monitoring networks and regulatory programs involved in the tracking, management, and abatement of surface water pollution. The 303(d) analysis differs from the 305(b) and 314(a) assessments in terms of statistical approach and monitoring period of interest. Moreover, under the provisions of the CWA, the 303(d) list is subjected to public review/comment approval by the U.S. Environmental Protection Agency (EPA).

Organization of Report

The remainder of this report is divided into several major parts. Part B contains background information on surface water resources within the state, describes the governmental programs

primarily responsible for improving water quality, considers the overall costs and benefits of water pollution control, and summarizes several important water quality issues facing Kansas. Part C discusses the various water quality monitoring programs administered by KDHE, the diagnostic criteria and statistical methods employed in the 303(d) and 305(b) analyses, and the major findings stemming from these analyses. Part D summarizes the current status of groundwater quality monitoring efforts in Kansas. Finally, Part E describes the measures taken by KDHE to comply with the public participation provisions of the CWA, as related to the development of the 303(d) list. Technical appendices to this report provide additional information on KDHE's water quality monitoring programs and the results of the most recent assessments. Specifically, **Appendix A** identifies the individual water chemistry and fish tissue parameters considered in the 2014 305(b) assessment, and **Appendix B** presents the most recently completed 303(d) list for Kansas.

PART B. BACKGROUND

Total Waters

Table 1 shows a summary of the waters of the State of Kansas (KDHE 2013), along with other geographic and demographic information. The waters on the Kansas Surface Water Register have received Use Attainability Analyses (UAAs) according to standard procedures (KDHE 2012).

Table 1. Geographic information on the total waters of Kansas

Topic	Value	Data Source
State population	2,853,118	U. S. Census Bureau, 2010 Census
State surface area in square miles	81,758.72	U. S. Census Bureau, 2010 Census
Number of major river basins	12	Dec 12, 2013 KSWR +
Total classified stream miles++	30,278	Dec 12, 2013 KSWR +
Total classified stream miles designated for food procurement	22,235	Dec 12, 2013 KSWR +
Number of lakes, reservoirs, and ponds (publicly owned or accessible)++	322	Dec 12, 2013 KSWR +
Acres of lakes, reservoirs, and ponds (publicly owned or accessible)++	190,445	Dec 12, 2013 KSWR +
Acres of freshwater wetlands (publicly owned or accessible)++	55,969	Dec 12, 2013 KSWR +

+ The functional stream geometry of the 2013 Kansas Surface Water Register (KSWR) is derived from the 1:24,000 scale National Hydrography Dataset (NHD), projected in Lambert Conformal Conic North America (Clarke 1866) and trimmed at state boundaries. Lake and wetland acreage estimates are based on adjusted areas of NHD polygons.

++ This includes classified waterbodies as well as those pending formal acceptance of proposed classification and use designations

Water Pollution Control Program

I. POINT SOURCE POLLUTION CONTROL

The Kansas point source program was initiated in 1907 (K.S.A. 65-161 *et seq*.) and continues to be modified and expanded in response to ongoing amendments to the CWA. The federal regulations implementing this law are found in Title 40 of the Code of Federal Regulations. Federal water pollution control programs are designed to protect the navigable waters of the United States, whereas the Kansas Water Pollution Control KWPC Program is designed to protect all surface water and groundwater resources in the state by controlling discharges from municipal, federal, commercial, and industrial wastewater treatment facilities (WWTFs), permitted concentrated animal feeding operations (CAFOs), and urban and industrial stormwaters.

KDHE is authorized to administer federal and state laws governing the treatment, re-use, and discharge of wastewaters in Kansas. Specifically, the department is responsible for the development, public notice, issuance, and periodic review of water pollution control permits; the approval of engineering plans and specifications for WWTFs and sewage collection systems; the

development of stormwater best management practices (BMPs); the establishment of pretreatment requirements for facilities in non-pretreatment program cities; and the performance of treatment plant compliance reviews. The department also oversees the development and management of operator training and certification programs in Kansas. Non-overflowing WWTFs are regulated through the Kansas Water Pollution Control permitting system (K.S.A. 65-165). National Pollutant Discharge Elimination System (NPDES) permits are required for all discharging WWTFs, large and medium Municipal Separate Stormwater Sewer Systems (MS4s) and large agricultural facilities (**Table 2**). Agricultural facilities primarily include CAFOs but also include other animal feeding operations as well as some livestock markets and livestock truck washes. Wastewaters generated by these treatment facilities and operations are subject to technological effluent limitations, effluent guideline limits, and the Kansas surface water quality standards. Individual permits normally are issued for a period of five years, and all are reviewed by KDHE prior to re-issuance. The state's WWTF permit compliance record for calendar years 2014 and 2015 is summarized in **Table 3.**

In addition to regulating wastewaters generated by these entities, the Kansas and federal programs have expanded into the area of stormwater pollution control. KDHE issues general permits for controlling stormwater runoff from construction and industrial sites, larger cities, and urbanized counties. Stormwater management plans have been implemented in 58 of the state's largest municipalities/counties/governmental entities and their surrounding areas to reduce the effects of stormwater runoff on receiving streams. In addition, stormwater pollution prevention plans are required for construction activities disturbing more than one acre of land and for certain classes of industries that conduct activities in which materials are exposed to rainfall. Industrial facilities with individual permits are also required to develop and implement stormwater pollution control plans as part of their individual permit requirements. Stormwater NPDES permits are normally issued for a period of five years (**Table 2**).

Table 2. Number of active KWPC and NPDES permits as of January 1, 2016

Municipal and Commercial		Industrial and Federal +		Agricultural ++		Stormwater	
Mechanical Treatment Facilities (NPDES) +++	127	Industrial and Federal Discharging (NPDES) +++	544	Agricultural Federal (NPDES)	435	Municipal Separate Stormwater Sewer Systems (MS4) (NPDES)	64
Discharging Lagoons (NPDES) +++	360						
Municipal and Commercial Non-discharging (KWPC)	410	Industrial and Federal Non-discharging (KWPC)	67	Agricultural State Permits (KWPC)	1343	Industrial Stormwater (NPDES)	1151
				Agricultural State Certificates (KWPC)	1559	Construction Stormwater (NPDES)	3027
Totals	*897*		*611*		*3337*		*4232*

KWPC = Kansas Water Pollution Control / NPDES = National Pollutant Discharge Elimination System
+ Tally does not include 55 industrial pretreatment facilities that discharge to municipal systems.
++ All agricultural facilities are nondischarging, but large facilities have combined Federal/State permits.
+++ Subject to monitoring by Compliance Monitoring Program and represented in Table 3.

Table 3. Permit compliance for discharging wastewater treatment facilities, 2012-2013

	Municipal and Commercial Facilities	Industrial and Federal Facilities
Total number of facilities	487	544
2012 absolute compliance+	95.5%	97.8%
2013 absolute compliance+	92.9%	95.7%

+ Absolute compliance means that a facility reported on all parameters specified in its NPDES permit and met all permit limits for the monitoring period (based on records submitted by the facility).

Over the past eleven years, a significant effort has been made to decrease nutrient (nitrogen and phosphorus) loadings to surface waters. In a document dated December 29, 2004, KDHE proposed and has since initiated a program whereby new and significantly upgraded mechanical wastewater treatment plants are required to construct and operate processes to reduce the amount of nitrogen and phosphorus in effluent discharges. As of January 1, 2016, more than half of the mechanical wastewater treatment plants that generate significant amounts of nitrogen and/or phosphorus have implemented or are building such nutrient reduction processes. The department uses a contractor to assist other large and major facilities to implement operational changes, if possible, or reduction by chemical addition. Also, the department has several contracts to provide on-site training assistance to existing mechanical treatment facilities to improve nutrient removal processes. Investments in such training and technology have reduced nutrient loads.

II. NONPOINT SOURCE POLLUTION CONTROL

Overview

Nonpoint source pollution refers to the transport of natural and man-made pollutants by rainfall or snowmelt moving over and through the land surface and entering lakes, rivers, streams, wetlands, or groundwater. The Watershed Management Section is responsible for developing the Kansas Nonpoint Source Management Plan, which provides a framework to coordinate agencies and organizationsinvolved in nonpoint source related management activities. KDHE's Watershed Management Section administers funding and coordinates programs designed to eliminate or minimize NPS pollution. To accomplish this goal, the section develops and reviews strategies, management plans, local environmental protection plans, and county environmental codes intended to control NPS pollution. These efforts are coordinated but are managed under several different programs.

The Watershed Restoration and Protection Strategy (WRAPS) program is one such effort administered by the Section; it offers a framework to engage citizens and other stakeholders in a teamwork environment aimed at protecting and restoring Kansas watersheds by developing and implementing 9 element watershed plans. These projects are supported in part by the CWA 319 funds.

The Drinking Water Protection Program is another program coordinated by the Section. It is designed to provide technical assistance to Public Water Supply Systems (PWSS) interested in writing and implementing a drinking water protection plan. Many PWSS are incorporated into Kansas WRAPS plans; however, those not covered by a WRAPS project are encouraged to complete drinking water protection plans.

The Local Environmental Protection Program (LEPP) provides technical, procedural, informational, and educational assistance to county sanitarians for implementing local environmental sanitary codes. These codes are unique to each county and provide guidelines and procedures for such things as private on-site wastewater systems, sanitary services, and private domestic water wells. The efforts of the LEPP program and local sanitarians complement other water quality and public health efforts implemented by state and federal agencies.

Finally, stormwater and NPS abatement projects have been supported through various funding mechanisms since 2009. A partnership between KDHE Watershed Management Section and KDHE Municipal Program used funds first from the American Recovery and Reinvestment Act (ARRA) of 2009, and then in 2010-2012 used part of the Green Project Reserve from the Kansas Water Pollution Control Revolving Fund.

After 2012, additional Green Project Reserve funding was no longer available to the Watershed Management Section for NPS pollution projects. Beginning in 2013, and continuing through 2014-2015, members of the Watershed Management Section staff have pursued development and implementation of the Local Conservation Lending Program, or LCLP. The LCLP makes funds available to local banks through a linked-deposit system in exchange for low-interest loans to eligible borrowers for conservation projects aimed at protecting water quality in Kansas. The pilot phase began in late 2015, with an official statewide roll-out anticipated in July 2016.

Watershed Restoration and Protection Strategy

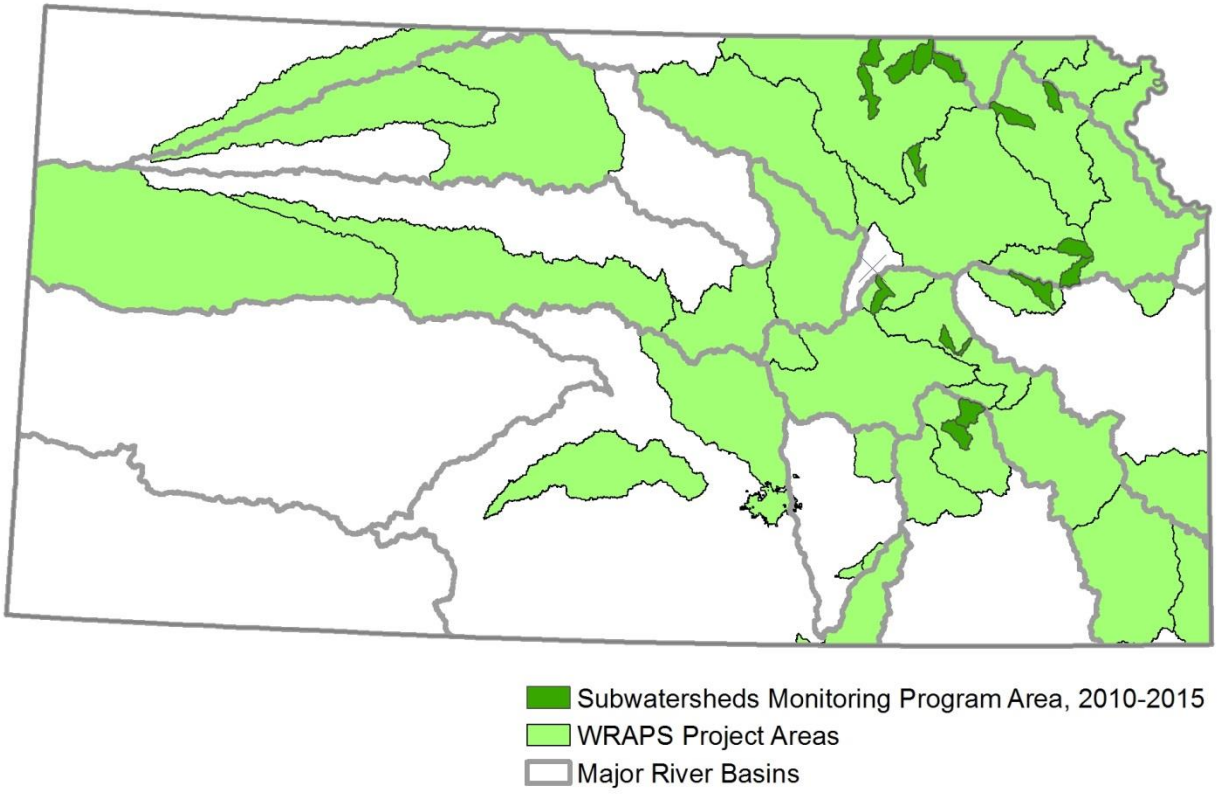
The WRAPS program is a voluntary targeted watershed-based program for controlling NPS pollution. This program is unique because the natural resource agencies of Kansas, with support from USEPA, aggressively seek citizen and stakeholder input and participation on watershed management and protection issues. This approach involves:

- Identifying watershed protection and restoration needs
- Establishing watershed protection and restoration goals
- Developing 9 element plans to achieve established goals
- Implementing fully developed plans

The 9 element watershed plans already implemented under WRAPS collectively serve and protect 45% of the state's total land surface (24,576,154 acres). This includes most watersheds draining into large federal reservoirs (**Figure 1**). Annual investments in WRAPS projects total approximately $2.5 million (M). Of this amount, about $0.6M is derived from State Water Plan funds and $1.9M from CWA section 319 funds. Additional funds for Best Management Practices (BMPs) come from programs administered by the Kansas Department of Agriculture's Division of Conservation as well as the Federal Farm Bill administered by the United States Department of Agriculture.

A KDHE initiative begun in 2010, the Subwatersheds Monitoring Program, tracks water quality changes over time in a selected set of HUC-12 subwatersheds as area stakeholders implement BMPs (**Figure 1**). It is a partnership between the Watershed Management Section and the Watershed Planning, Monitoring, and Assessment Section.

Figure 1. Kansas WRAPS Projects as of December 2015



Drinking Water Protection Program

The Drinking Water Protection (DWP) Program is built on the principle that prevention often costs less than treatment. The program identifies drinking water source restoration and protection needs and provides technical assistance to Public Water Supply Systems (PWSS) to restore and protect water quality to meet drinking water standards. KDHE encourages PWSSs and their surrounding communities to complete voluntary DWP plans. Local stakeholders establish source water goals, corresponding action steps are created in the DWP plan, and the plan is implemented and monitored.

DWP plans are built on data from Source Water Assessments (SWA). These SWAs were completed for all active PWSSs in 2004, as required by the 1996 amendments to the Safe Drinking Water Act, and funded by USEPA. The assessments identified all potential sources of contamination for each public water supply system and evaluated the susceptibility of the PWS to contamination. The SWAs were the first step in a comprehensive plan for protecting the public drinking water supply system. PWSSs and their surrounding communities use the SWA and the accompanying Susceptibility Analysis Scores to determine the contaminants and activities that pose the greatest threats to their water supply.

The DWP plan evaluates past SWA reports and performs a drinking water source investigation

that uses various water monitoring, modeling, and evaluation techniques to update knowledge of the potential for drinking water contamination. The plan describes current conditions of the drinking water protection area, including age of the PWSS, environmental assessments and investigation results, population, and land use. A completed plan describes action steps needed to protect the drinking water source. Implementation of the action steps is clearly outlined and scheduled along with a list of resources (funding, technical assistance, regulations, etc.) needed to fulfil the DWP plan objectives and goals. Milestones and a monitoring schedule allow the PWSS to track its efforts in implementation.

In addition to the DWP program, drinking water sources benefit from BMPs through WRAPS program. There are 63 public water supply systems (serving approximately 788,000 Kansans) relying on surface water sources from streams and/or reservoirs that directly benefit from NPS/WRAPS watershed project implementation.

Local Environmental Protection Program

The LEPP is administered by KDHE and has had several funding sources. From SFY1990 through SFY2010, it was funded by the Kansas Water Office (KWO) under the auspices of the State Water Plan. For SFY2011 and SFY2012, grant funds were allocated through the State General Fund. The program provided financial assistance to local governmental units developing and implementing environmental protection plans on behalf of their respective jurisdictions. All such plans included a sanitary code for regulating private water wells and private onsite wastewater treatment systems, and in addition addressed subdivision drinking water and wastewater treatment, solid and hazardous waste disposal, public water supply protection, and NPS pollution abatement. The program has provided no financial assistance to local governments since SFY 2013, so local governments now provide funding for the program through county general funds and user fees.

The role for KDHE has shifted from grant administration to providing technical assistance, information, and education to support local officials in administration of their Environmental/Sanitary Code. Currently 103 of the 105 Kansas counties participate in this program. The LEPP program is in the implementation phase of a five year plan designed to improve the efficiency in which local officials receive information, technical assistance, and guidance. Elements of this five year plan include:

- Develop a Model Environmental Sanitary Code to assist counties with code updates
- Update the procedure for Environmental Sanitary Code adoption or revision
- Develop a web page for septic haulers and pumpers
- Conduct a nutrient loading study for onsite wastewater systems
- Update the Kansas Environmental Health Handbook
- Update the LEPP web page
- Develop an online training center for sanitarians

Other Nonpoint Source Pollution Control Projects

Background and History

One of the Goals in the Kansas Nonpoint Source Management Plan is to institute a revolving loan fund for NPS projects, and to that end KDHE Watershed Management Section and KDHE Municipal Programs Section have formed a partnership.

This effort was begun in 2009, when approximately $5.7 million of the American Recovery & Reinvestment Act (ARRA) funding was set aside to support NPS/green infrastructure projects administered through the Watershed Management Section (WMS). Eleven projects were awarded in the form of low-interest loans with principal forgiveness. Funded projects use innovative technologies for sustainable stormwater management and NPS pollution abatement, such as constructed wetlands, native grass plantings, pervious pavement, bioretention swales, rain gardens, and stormwater reuse systems, as well as some streambank stabilization and restoration work.

Green Project Reserve

In FFY 11 and 12 (October 2010-September 2012), the Kansas Water Pollution Control Revolving Fund (KWPCRF), which has traditionally been used for treatment plant upgrades, reserved $5.1 million of its funding over two years for Green Project loans. The fund issued a Call for Proposals that outlined submission requirements, project eligibility, and applicant qualifications for NPS projects funded through the KWPCRF. Selected projects were notified of the funding award; pre-award meetings were held to outline the loan application process and requirements; and efforts continued to complete loan applications and secure executed loan agreements. Five projects were funded in FFY 2011, and another five in FFY 2012. These projects included streambank stabilization, restoration with riparian/vegetated buffers, pervious pavement with underdrain systems for stormwater storage, and bioretention swales and rain gardens.

Due to reductions in federal funding, the availability of the KWPCRF to implement NPS projects will be limited in the future. As a result, KDHE WMS, in coordination with other state agencies, has developing a sustainable low-interest revolving loan fund specifically for NPS pollution control projects. KDHE WMS continues its efforts toward the planning and development of a loan program that would be utilized to fund a variety of NPS projects where future funding will be unavailable.

Local Conservation Lending Program

The Local Conservation Lending Program (LCLP) was officially created during the 2014-2015 legislative session through the passage of House Substitute for Senate Bill 36 (H Sub for SB 36). The bill authorizes KDHE to implement the program throughout the state of Kansas. The purpose of the program is to make funds available through a linked-deposit system to local banks, in exchange for low-interest loans to eligible borrowers for water quality protection projects. Eligible projects fall into four main categories: General Conservation Projects, Livestock Projects, Stream Restoration Projects, and Onsite Wastewater Assistance.

Through the continued partnership between the KDHE WMS and KDHE Municipal Programs Section, approximately $1 million annually in KWPCRF set-aside funds has been made available for four years for the LCLP deposits/investments. The program can be combined with other cost-

share programs for qualifying projects, providing an additional means to leverage state resources to implement high priority projects aimed NPS pollution abatement.

Since the LCLP statutes were enacted July 1, 2015, the KDHE WMS developed an Appendix to the Kansas Nonpoint Source Pollution Management Plan, to establish the criteria, requirements, and procedures for implementation of the program as directed in K.S.A. 2015 Supp. 65-3330. The Appendix includes eligibility criteria, practices eligible for funding through the program, eligibility criteria for borrowers, eligibility criteria for costs, project completion and certification requirements and process, and other program requirements.

KDHE has also begun the 'pilot phase' of the program, which includes identifying a number of lending institutions (banks) and potential project(s) for the first stage of implementation. The pilot phase will work through a few projects in close coordination with participating lenders and agency partners in order to address any comments or concerns. The pilot phase will also identify improvements to the program process, applications, and procedures before the official statewide program rollout, which is anticipated for July 1, 2016.

Cost/Benefit Assessment

The direct and indirect costs of water pollution control can be measured, or at least estimated, with some degree of confidence. In contrast, environmental benefits stemming from pollution control are less amenable to expression in monetary terms. Section 101(a) of the CWA establishes national water quality objectives and interim goals reflecting the belief that the costs of water pollution control are outweighed by the ecological and social benefits of clean water. The following paragraph and accompanying tables address some of the major costs associated with water pollution control efforts in Kansas.

Pollution control expenditures in the state are associated predominantly with administrative expenses, capital investments, and operational costs for WWTFs. Although little information is available regarding the control costs borne by industrial and agricultural facilities, capital expenditures associated with the construction and upgrading of municipal WWTFs have been documented by KDHE. For example, the department administers the KWPCRF, which provides low interest loans to municipalities for water pollution control projects. Available monies are maximized through the sale of "leveraged revenue bonds." During the past twenty-six years, these bonds have provided 452 loans totaling $1.17 billion for facility improvements. KDHE also coordinates with the Community Development Block Grant (CDBG) program, which is administered by the Kansas Department of Commerce. This program typically provides grant funding for about 50% of the costs of a selected water pollution control project. During 2014 and 2015, KWPCRF, CDBG, and other state and federal programs provided about $116.8 million in financial aid to communities (**Table 6**). NPS pollution abatement measures received much less funding, relying instead on predominantly voluntary measures and cost-share programs previously discussed.

Table 4. KDHE cooperative funding for construction and expansion of municipal wastewater treatment facilities

Funding year	KWPCRF +	CDBG +		RD +	
	Basic Program ++	Federal	Match++	Federal	TOTAL
2014	$ 54.02 M	$ 3.499 M	$ 0	$ 7.877 M	$ 65.396 M
2015	$ 41.49 M	$ 2.622 M	$ 0	$ 7.324 M	$ 51.436 M
Total	$ 95.51 M	$ 6.121 M	$ 0	$ 15.201 M	$ 116.832 M

Monetary values presented in millions of dollars.
+ KWPCRF = Kansas Water Pollution Control Revolving Fund / CDBG = Community Development Block Grants / RD = Rural Development Grants and Loans
++ All match funding for CDBG projects was provided by KWPCRF or RD

Special Concerns and Recommendations

The current major environmental concerns for the surface waters of Kansas can be divided into four categories: agricultural concerns, municipal/industrial concerns, nuisance aquatic species, and variations in flow regimes.

I. AGRICULTURAL CONCERNS

Given the extent of agricultural land use in Kansas, it is unsurprising that agricultural practices exert a profound influence on surface water quality conditions. Erosion of cropland soils produces elevated concentrations of silt in many streams and lakes, often to the detriment of native aquatic and semiaquatic life. The presence of nitrogen- and phosphorus-containing fertilizers in field runoff promotes nuisance growths of algae and detracts from the recreational and drinking water supply uses of surface water. Stormwater runoff from uncontrolled feedlots, livestock wintering areas, and heavily grazed pastures introduces pathogens and oxygen consuming organic wastes into nearby lakes and streams, sometimes compromising the sanitary condition of these waters. Pesticide residues in streams and drinking water supply lakes can affect aquatic biota and pose potential long-term risks to human health.

Nonpoint source pollution potential has also been increased through conversion of grassland and good riparian areas to commodity crops, mainly corn. When commodity prices increased and United States Department of Agriculture (USDA) started subsidizing crop insurance, thousands of acres of Conservation Reserve Program (CRP) land and non-CRP grass and riparian areas were converted to corn. Even though some areas were put into no-till, the removal of deep rooted native species and a developed soil microbe community reduced infiltration, increased the likelihood of erosion and sediment deposition from ephemeral gullying, and increased the need for fertilizers and pesticides. Cropping activity next to streams was also potentially destabilized. Another trend is that with larger equipment and no-till practices, grassed waterways are deemed as loss of valuable cropland and a deterrent to time-efficient farming. This has led to an increase in the use of underground outlet terraces. These practices are sometimes approved by USDA Natural Resource Conservation Service (NRCS) but can create a conduit for dissolved and particulate pollutants being discharged near or directly into a stream if there is not adequate containment or filter.

Efforts to alleviate the impacts of agriculture on the aquatic environment have focused primarily

on the abatement of soil erosion and proper management of chemical fertilizers, biocides, and livestock wastes. Although the wider adoption of agricultural BMPs is underway and should lead to measurable reductions in stream contaminant levels, runoff water quality is not the only agricultural factor limiting the use attainment of surface waters. Throughout much of western Kansas, decades of irrigated crop production have exacted a heavy toll on stream life by lowering groundwater tables, reducing base streamflows, and transforming formerly perennial waterbodies into intermittent or ephemeral systems. In some areas of northeastern Kansas, stream channelization has radically simplified the original aquatic habitats and decimated a formerly diverse fish and shellfish fauna. Impoundments (large and small) throughout the state have encouraged the establishment of predominantly nonnative fish assemblages, fragmented the remaining stream habitats, and diminished the seasonal peak flows required by certain native fishes for spawning and egg development.

The complete restoration of these degraded aquatic ecosystems would require large-scale habitat rehabilitation efforts and fundamental changes in the laws, policies, and practices currently dictating the use and allocation of water in Kansas. Some more readily implemented options for partially offsetting the historical effects of agriculture include: enhancing minimum streamflows through the State-mediated purchase and retirement of senior water rights, expanding hatchery restocking programs for native fish and shellfish; selectively removing lowhead dams and other barriers to fish migration; installing fish ladders and elevators on larger dams, and other related management initiatives – all in addition to concurrent improvements in agricultural practices. Most of these concepts are not new; for example, the importance of maintaining migrational corridors for fish was emphasized repeatedly by Kansas officials during the late nineteenth century but never seriously considered in the course of water resource development (Angelo, Cringan and Haslouer 2003).

One way to reduce the likelihood of polluted runoff is through a systems approach with cover-crops and no-till. These practices have been increasingly supported by USDA on a national scale, through their "Soil Health Initiative" which provides technical assistance and facilitates educational workshops for landowners and other USDA or state agency staff. Additionally, the WRAPS program (http://www.kswraps.org) promotes cover crops and no-till to reduce nutrients and sediment in targeted watersheds with impaired waters. Managed cost share also reduces the likelihood of polluted runoff. For example, the WRAPS programs discourages replacing grassed waterways with underground outlet terraces unless they have a sediment retention or constructed wetland structure, and the Kansas Department of Agriculture's Division of Conservation will only allow counties to provide cost share on such projects if a grassed waterway is completely irreparable or the land/cropping system has changed to a point where the grassed waterway is no longer effective.

Many of these efforts are also being coordinated across various state and federal agencies. A Nutrient Reduction Plan was created by KDHE in 2004. In 2010 it was expanded and formalized as the Kansas Nutrient Reduction Strategy, which includes collaboration with the Kansas Water Office, Kansas Department of Agriculture, and Kansas Department of Wildlife, Parks, and Tourism. In 2013, Governor Sam Brownback asked state agencies to work together with his administration on a fifty-year water vision. As a result, the Kansas Water Vision task force and planning documents (State of Kansas January 2015) have created an even more permanent

infrastructure for interagency collaboration on issues surrounding statewide water supply and, to some degree, water quality. The coalition of agencies work with state mechanisms as well as helping to coordinate and leverage federal programs such as USDA Farm Service Agency's Conservation Reserve Enhancement Program (CREP), which provides incentives to remove environmentally sensitive land from production and implement conservation practices.

II. MUNICIPAL AND INDUSTRIAL CONCERNS

Discharging WWTFs and other point sources influence surface water quality throughout much of Kansas. Inorganic nitrogen and phosphorus released from some facilities promote blooms of filamentous or scum-forming algae in downstream waters and detract from their capacity to support primary and secondary contact recreation. Bypasses of raw or partially treated sewage occur each year, owing to treatment plant capacity limitations, malfunctions, operator error, and natural catastrophes. Such bypasses can result in fishkills and other serious water quality problems.

Stormwater runoff from lawns, golf courses, roadways, and parking lots often contains a complex mixture of chemical pollutants (*e.g.*, herbicides and pesticides, fertilizers, oil, grease, antifreeze, de-icing salts, solvents, detergents, asbestos). These substances can prevent the development and maintenance of representative aquatic communities in receiving surface waters. Similarly, concentrations of mercury, polychlorinated biphenyls (PCBs), and other bioaccumulative contaminants in fish taken from urban streams may pose unacceptable risks to human consumers. In addition, data related to the accumulation, transport and fate of animal and human pharmaceuticals, hormones, personal care products, and other ubiquitous chemicals such as polybrominated diphenyl ether (PBDE) fire retardants are needed in Kansas as well as the rest of the country. Although the concentrations of such chemicals in the water column are most often minute, the processes of bioaccumulation and subsequent biomagnification in the food chain may concentrate these chemicals in fish tissue to levels that subject human and wildlife consumers to a risk of deleterious effects. Consumers of fish exposed to these contaminants and/or their degradation products may be exposed to concentrations in fish tissue many times greater than the concentrations occurring in the ambient environment. Although the USEPA has acknowledged the importance of monitoring and determining safe levels of these contaminants of emerging concern (CECs) in both fish tissue and water (https://owpubauthor.epa.gov/scitech/cec), analytical and financial support for implementation at the state level has not been forthcoming.

Unplanned and extensive urban growth can negatively influence the physical habitats supporting aquatic life, in part because eliminating and altering permeable land surfaces, wetlands, and riparian areas diminishes urban watersheds' capacity to remove pollutants and mitigate the effects of flooding. Stormwater runoff from impervious surfaces such as paved areas and rooftops can lead to powerful flooding events, capable of scouring stream bottoms and eliminating the habitat required by some native aquatic species. The channelization of urban streams results in highly simplified aquatic habitats incapable of supporting the full range of fish and wildlife indigenous to this region. In many instances, the negative effects of high density development on streams, lakes, and wetlands could be reduced through urban planning, employing established BMPs, maintaining green corridors around water bodies, and strategically

designing the placement of development. The retention of natural corridors or "greenways" along rivers and creeks, and observance of the intent of the antidegradation provisions of the surface water quality standards (KDHE 2012), would do much to preserve the natural physical and chemical attributes of the state's urban streams. Local, state, and federal authorities also could support more litter cleanup initiatives. Improving the visual and aesthetic character of urban waters would increase their perceived value and encourage protection and sustainable use.

Some streams also suffer from illegal dumping of trash and other unwanted materials. The practice of discarding grass clippings, brush, and animal carcasses into streams (and the subsequent decay of these materials) reduces dissolved oxygen levels and jeopardizes populations of fish and other aquatic life. Discarded appliances and electronics, paint cans, pesticide containers, and batteries may leach toxic materials, thereby posing a threat to resident aquatic biota.

On a positive note, the deliberate and systematic renovation of many wastewater treatment facilities has noticeably improved surface water quality over the past few decades, and this progress continues. As point sources contributing to water quality impairments decline, attention will shift increasingly to nonpoint sources. Watershed pollution control efforts, predicated largely on the development and implementation of TMDLs, through WRAPS, will play an increasingly important role in abatement of nonpoint source pollution.

III. NUISANCE AQUATIC SPECIES

Several exotic plant and animal species have established populations within the state, and some pose a serious risk to native aquatic life and the beneficial uses of surface waters. For example, Asian clams (*Corbicula fluminea*) have established large populations in streams and lakes throughout the state, and the zebra mussel (*Dreissena polymorpha*) has gained a foothold in recent years in several major river basins. Both of these exotic bivalves can compete with or otherwise injure native shellfish species, and the zebra mussel in particular can impair designated recreational and drinking water supply uses. At least three species of Asian carp have been reported in Kansas (bighead carp, *Hypophthalmichthys nobilis*; silver carp, *Hypophthalmichthys molitrix*, and grass carp, *Ctenopharyngodon idella*), as well as white perch *(Morone americana)* and rudd *(Scardinius erythrophthalmus)*; additional exotic fishes are expected to appear in Kansas in the near future. These animals can compete with native fish for food and shelter, and some dramatically reduce water clarity by disturbing bottom sediments during feeding.

A number of introduced plant species also have proven problematic. Thickets of salt cedar (*Tamarix* spp.) have become established along many streams in western and central Kansas, crowding out the native riparian vegetation and removing (via evapotranspiration) vast amounts of water from the adjoining streams and underlying alluvial aquifers. Purple loosestrife (*Lythrum salicaria*) has become the dominant herbaceous species in many wetlands, overwhelming many of the state's native plants and jeopardizing the animals depending on these plants for food and shelter. Eurasian watermilfoil (*Myriophyllum spicatum*), an exotic plant sold in the aquarium trade, has been documented in several streams in western Kansas and in scattered lakes throughout the state. This plant propagates via seeds and vegetative fragments and can spread rapidly between waterbodies by attaching to boat propellers, boat trailers, and fishing gear.

Curly-leaf pondweed (*Potamogeton crispus*) has also been found in seven publicly accessible lakes. Once introduced into a lake or stream, these plants can form dense mats of vegetation that can interfere with recreational activities, crowd out native aquatic vegetation, disrupt the feeding behavior of native fish, and choke water intakes used for municipal water supply, power generation, and irrigation. An even more invasive and potentially damaging exotic aquatic plant. Hydrilla (*Hydrilla verticillata*) has been discovered in two discrete locations in northeast Kansas during the last few years (an urban park lake, and a restaurant's outdoor water garden). The expansion of this exotic aquatic species carries with it, based on experiences elsewhere, and even greater potential for environmental and water infrastructure damage.

IV. VARIATION IN FLOW REGIMES

Aquatic plants, animals, plankton, and microbes are adapted to live in particular environments. For example, some fish do best in fast-flowing riffles, whereas others thrive in deep lakes. Even within a given species, habitat requirements may change over the course of a lifetime or on a seasonal basis, to support survival, growth, and reproduction. Alteration of flow regimes from historical, natural conditions can disrupt habitat and affect individual species, relationships in food webs, and the aquatic community as a whole.

Throughout history, humankind has recognized the need to manage natural resources in a way that makes them usable but also sustainable, and this requires balancing priorities. For example, we construct dams to create reservoirs, which help control flooding and create stable water supply sources. At the same time, we recognize that impounded systems must also release water to support downstream uses, and must do so at a rate and on a schedule that supports the habitat requirements of aquatic communities as well as the water rights of human users downstream. Over time, we adjust our management policies and priorities as we gain knowledge and understanding.

Many factors, both natural and anthropogenic, can change the amount and timing of streamflow. Direct withdrawals from a stream (for example, for domestic, municipal, or industrial use) and discharges to a stream (from point sources) are easily observable impacts, but other impacts are less obvious. Changes in groundwater levels can affect baseflow conditions. A recent study on southwest Kansas streams has demonstrated a linkage between groundwater withdrawals and declining streamflows (Juracek 2015), which confirms earlier observations of the same patterns (R. T. Angelo 1994).

Flow rates can be accelerated, slowed, or stopped by changing or confining the contours of stream channels – through straightening, dredging, installing levies and revetments, and the like – or by introducing impoundments, which range from major reservoir projects and farm ponds to low-water crossings and beaver dams. Flow can also be changed by modifying the land surface, which affect how precipitation flows overland. Examples of this include installing impervious surfaces, terracing, or constructing ditches and drains. Any of these changes, by altering flow regime, can in turn propagate a cascade of changes both upstream and downstream as the stream or river redistributes sediments, changes its depth, width, and course, and returns to equilibrium.

Overlaid upon these other alterations (both anthropogenic and natural), changes in weather

patterns can produce dramatic and readily observable changes in streamflow. The amount, timing, and rate of precipitation all affect streamflow, and these factors interact to determine the absolute and relative rates of runoff, evaporation, infiltration, and groundwater recharge. In the past fifteen years, Kansas has witnessed two major droughts (2000-2006 and 2010-2013) as well as numerous instances of localized flooding. If weather trends observed in Kansas over the past 30 years continue, with gradual increases in both absolute precipitation and temperature over time (National Oceanic and Atmospheric Administration 2016, National Oceanic and Atmospheric Administration 2016), this will undoubtedly shift the seasonal baselines of surface water availability.

Changes in historic, natural streamflow patterns affect not only habitats available for aquatic communities, but also transport of sediment and pollutants. The majority of pollutant loads to streams and lakes is borne by relatively large, short-duration, infrequent storm events and their associated runoff production. The magnitude of these runoff events may overwhelm most Best Management Practices, when they exceed the typical design storm (e.g., 25-yr recurrence interval) handled by those practices. Alterations to historic rainfall-runoff responses, such as changes in climate patterns that intensify storms, or increases in a watershed's impervious cover that reduce infiltration, increase the likelihood of damaging runoff and pollutant loads being delivered to water bodies despite investments in BMPs. Conversely, conditions that prolong or aggravate low flow situations induce flow stagnation, which prevents beneficial re-aeration that cleanses the stream systems and extends the time that pollutants are in contact with aquatic life.

Many of the factors that affect streamflow variation are difficult or impossible to manage. The Clean Water Act does not directly address flow management, so pollution resulting from flow alterations defy the typical regulatory tools provided by the Act. Even so, it in our shared best interest to understand, anticipate, mitigate, and plan our responses, given that alterations of natural flow regimes will likely present increasing challenges to managing water quality and maintaining water supplies.

V. CONCLUSIONS

Taken together, these threats can seem daunting. However, various state and federal programs are making incremental efforts to abate the impacts of those activities. For example, NPDES permits tying urban stormwater to impaired waters and directing appropriate corrective practices have been drafted. Kansas is implementing a State Nutrient Reduction Strategy to reduce phosphorus and nitrogen in surface waters. WRAPS groups direct funding to critical subwatersheds to reduce NPS pollutant loads, and the Subwatershed Monitoring Program tracks improvements.

Many of these activities have been tied together and enhanced through the Kansas Water Vision (State of Kansas January 2015). Several of the Phase I Action Items already underway deal directly with nutrient and sediment issues. Although the primary focus in many efforts is reducing sediment and nutrient transport into drinking water reservoirs, many applicable management practices limit movement of other pollutants as well. Along with interagency collaboration, a centerpiece of Water Vision initiatives is citizen engagement. This builds on the tradition of education campaigns implemented by KDHE, KDWPT, and others to create

awareness of water quality issues, promote precautions that limit migration of invasive species, and encourage water conservation.

One important innovation of the Kansas Water Vision task force has been to create Regional Planning Areas (RPAs), customized to the resources and needs of different parts of the state. The draft RPAs are based on a hybridization of Groundwater Management Districts, following the boundaries of the High Plains Aquifer and county boundaries in the west, and Basin Advisory Committees, following basin boundaries in the east. This configuration of local representation reflects Kansas' long-standing acknowledgement that surface water, alluvial groundwater, and deep groundwater are distributed unevenly across the state and that these local variations of interconnected water resources must be understood and considered in policy deliberations.

There have also been structural changes to state water use law that will encourage conservation; these include elimination of the "use it or lose it" rule for groundwater rights and introduction of multiyear flex accounts that allow irrigators to budget water use over five years rather than one (Kansas House Bill 2451 and Kansas Senate Bill 272; see Kansas Water Authority 2012). In 2012 the Legislature authorized Local Enhanced Management Areas (LEMAs) in western Kansas to combat groundwater declines through local management strategies (Kansas Senate Bill 310 / K.S.A. 82a-1036), and one is already in place.

Broad-based conservation and restoration collaborations proceed as partnerships, mechanisms, and funding become available. For example, KDWPT, in partnership with the US Fish and Wildlife Service and the City of Wichita, is installing a fish passage structure in the Arkansas River, which is Designated Critical Habitat for several state-listed fish species.

In a settlement over the Republican River Compact with Nebraska, Kansas recently received $5.5 million; of this, $3.5 million will be used for conservation projects in the Lower Republican River Basin, with oversight from the Kansas Water Office; much of the funding will be used for irrigation efficiency infrastructure in the northcentral part of the state. In the southeastern corner of Kansas, which has a long mining history, KDHE is working with Pittsburg State University's Monahan Research Center and the federal Office of Surface Mining to design a remediation wetland to treat acid mine drainage.

Another restoration project underway in southeast Kansas is aimed at restoring native aquatic communities. In March 2014, KDHE and KDWPT signed a Memorandum of Agreement to implement Natural Resource Damage Assessment (NRDA) activities at the Farlington State Fish Hatchery. This Memorandum included a provision for some funding by KDHE to KDWPT for the implementation, construction, operation, management, and maintenance of a native species facility, called the Kansas Aquatic Biodiversity Center (KABC). The engineering phase of the project is 95% complete, and construction is anticipated in 2016. This facility will serve as a hatchery for native freshwater mollusks as well as fish. These native species will be used in a variety of restocking and restoration efforts. Many species are imperiled or in need of population augmentation, while other species need re-establishment due to natural resource damage.

Over time, these programs can improve the health and intrinsic value of our aquatic ecosystems, thereby increasing their economic and cultural value to the citizens of Kansas. Effective program

implementation requires investment in continued systematic, thorough, high quality monitoring of water resources and aquatic communities. This will direct limited resources to the highest priority waters while building a foundation of sound scientific evidence to evaluate and improve restoration strategies and measure their success.

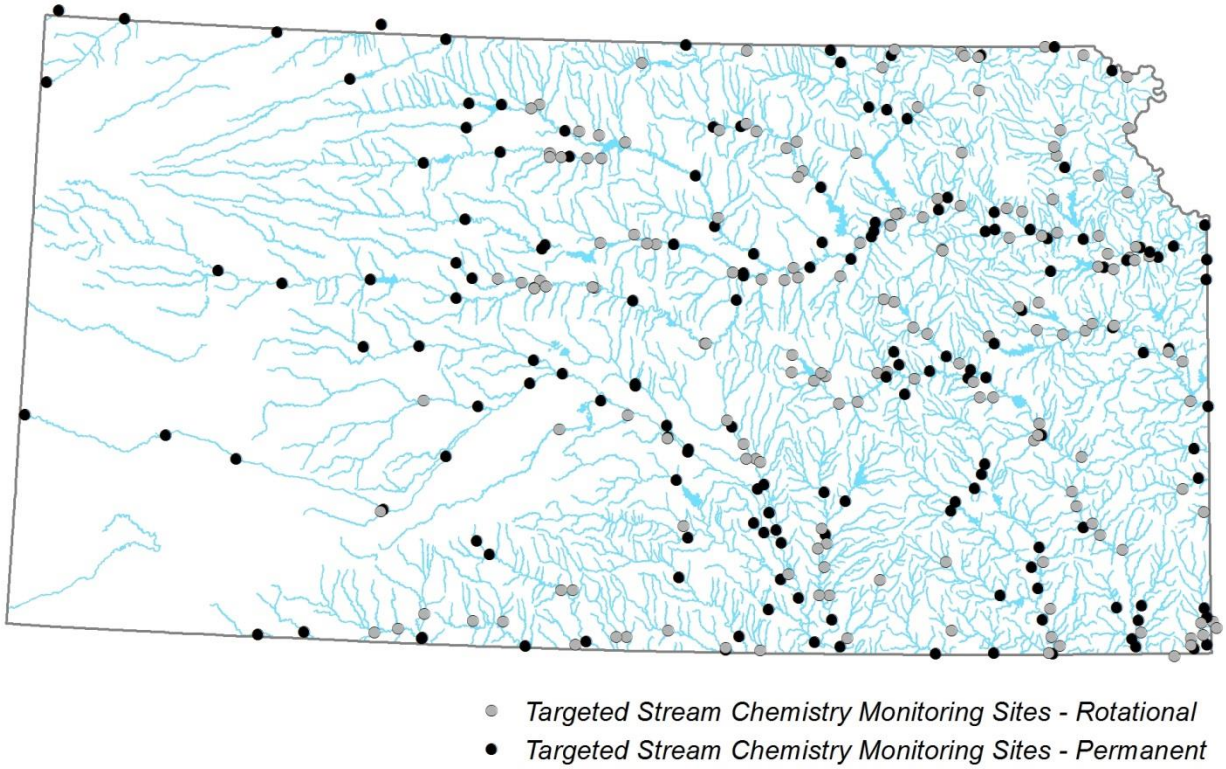
PART C. SURFACE WATER MONITORING AND ASSESSMENT

Monitoring Programs

I. TARGETED STREAM CHEMISTRY MONITORING PROGRAM

The stream chemistry monitoring program is the longest running environmental monitoring operation administered by KDHE; it currently resides with other surface water monitoring programs in the BOW Watershed Planning, Monitoring, and Assessment Section. Water samples routinely collected from streams throughout Kansas are analyzed for a suite of physical, organic, inorganic, bacteriological, and in some cases radiological, parameters (**Appendix A**). The program database currently comprises over two million records representing nearly 400 active and inactive monitoring locations and approximately 100 different analytical parameters. Some records in the database date to the late 1960s, and several monitoring sites have a continuous period of record extending from that time to the present (KDHE 2014).

Figure 2.Targeted Stream Chemistry Monitoring Program Sites

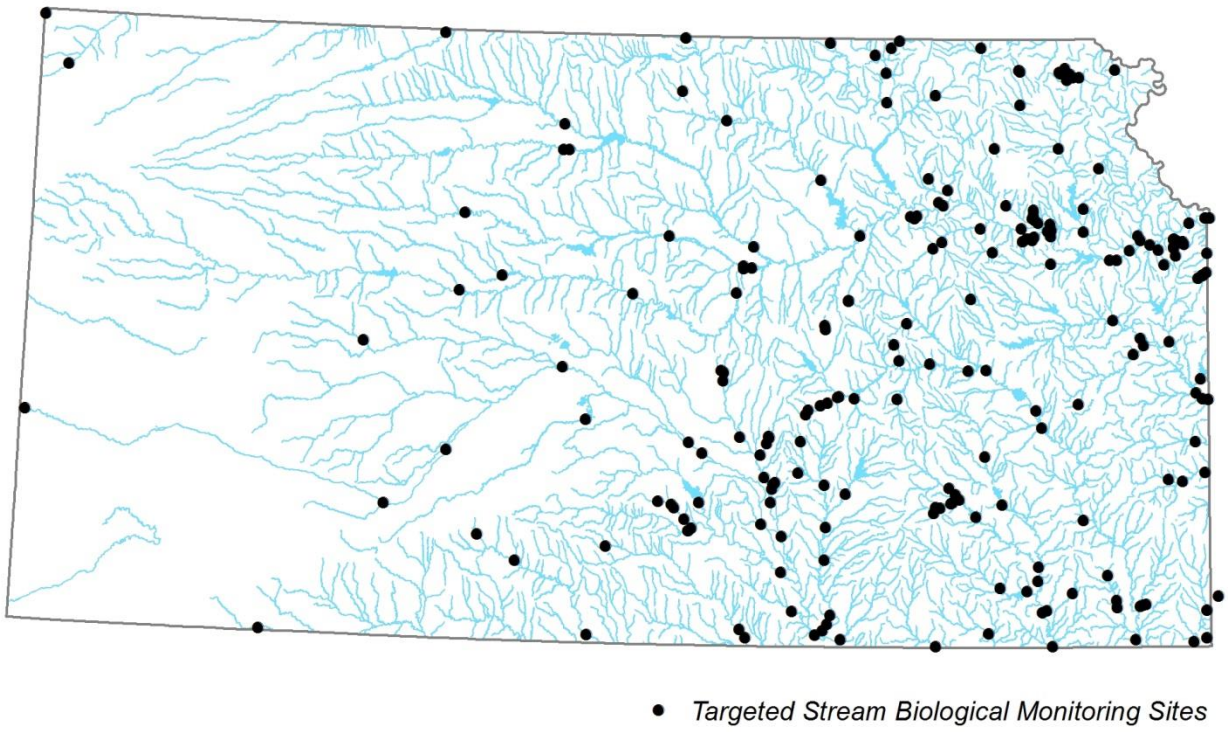


The stream chemistry sampling network currently comprises 329 active monitoring sites spanning all the major river basins and physiographic regions of Kansas (**Figure 2**). Monitoring personnel visit about 160 core sites on a quarterly basis every year, whereas the remaining 169

sites are monitored using a four-year rotational approach; *i.e.*, samples are collected quarterly from approximately 25 percent of rotational sites each year. Sampling sites have been chosen to represent water quality conditions in specifically targeted watersheds or stream reaches. For example, some sites reflect water quality conditions in streams as they enter or exit Kansas, others represent conditions above or below major WWTFs, urban areas, or reservoirs, and still others reflect water quality conditions in predominantly rural watersheds. A few "minimally altered" and several "least impacted" reference streams are included in the network to gain a better understanding of baseline water quality conditions in various ecoregions (Chapman, et al. 2001). As currently configured, the network provides water quality information useful to characterizing pollutant loadings from more than 97 percent of the state's contributing drainage area. Many monitoring sites are located near the lower terminus of eight-digit hydrologic unit code (HUC) watersheds and play an important role in the development and refinement of TMDLs for 303(d)-listed streams.

II. TARGETED STREAM BIOLOGICAL MONITORING PROGRAM

Figure 3.Targeted Stream Biological Monitoring Program Sites



This program examines the structural attributes of aquatic macroinvertebrate assemblages to provide a more refined picture of the ecological status of streams (KDHE 2012). Unlike water chemistry measurements alone, which reflect conditions occurring at the moment of sample collection, biological monitoring provides an integrated measure of environmental condition over time frames ranging from weeks to years, depending on the biological assemblage of

interest. The majority of the program's monitoring sites are also Stream Chemistry Monitoring Program sites. Fewer biological monitoring stations can be visited throughout the year than chemistry stations; however, combining biological and chemical sampling at selected key sites provide a more complete picture of ecological status than either method alone. Samples normally are obtained from 45-65 network sites each year as dictated by TMDL development needs, special projects, or other regulatory considerations.

Over the course of 36 years, the program has developed a sampling network that includes 222 current and historical monitoring sites distributed throughout the state (**Figure 3**). Some stations have been sampled annually for the entire period of record. The program's database currently contains some 80,094 predominantly genus/species level records (467,835 individual organisms), and a separate freshwater mussel database contains approximately 15,000 high resolution records. Data from this program are used primarily in the development and refinement of TMDLs for 303(d)-listed streams and special studies.

III. PROBABILISTIC STREAM MONITORING PROGRAM

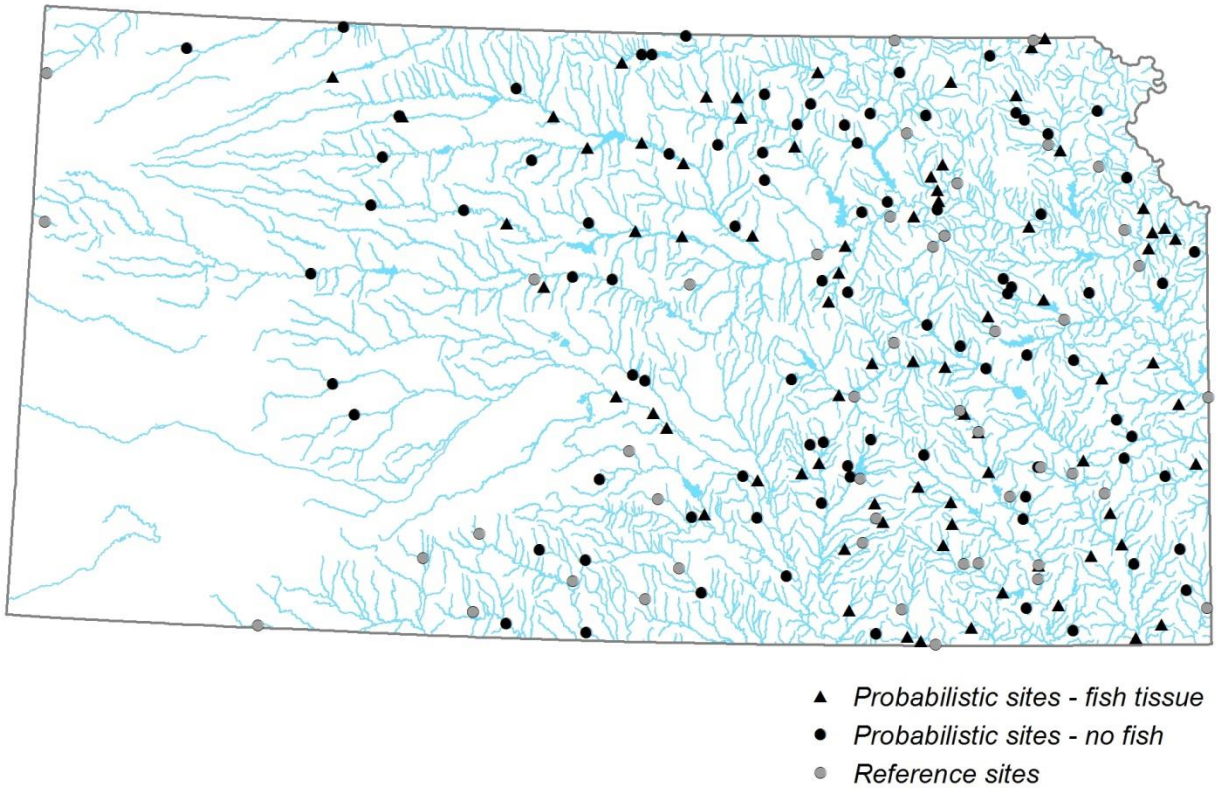
Probabilistic sampling is a method of environmental monitoring that yields statistically valid representative information on the physical, chemical, and/or biological condition of natural resources. It differs from conventional targeted sampling in that probabilistic monitoring stations are a randomly selected subset of the resource as a whole. In Kansas, stream chemistry and stream biological monitoring programs traditionally have employed a targeted monitoring design that positions stations in a deliberate and strategic manner (*e.g.*, near the terminus of a specific watershed or above and below a discrete pollution source). Although these programs are of critical importance in determining site- and watershed-specific water quality conditions, funding and logistical constraints limit the number of targeted sites that can be sampled on an ongoing basis. In contrast, probabilistic monitoring focuses on the total resource rather than the individual monitoring locations. Results generated from this approach can be extrapolated with known confidence to the state's entire population of streams, including hundreds of smaller waterbodies (*e.g.*, headwater streams) largely outside the purview of the targeted monitoring programs.

In 2004, KDHE participated in USEPA's National Wadeable Streams Assessment and gained a familiarity with the application of probabilistic sampling designs and associated field methods (USEPA, 2006 and http://water.epa.gov/type/rsl/monitoring/streamsurvey/index.cfm). In 2005, availability of supplemental monitoring funds under section 106(b) of the CWA allowed KDHE to establish a probabilistic monitoring program. This effort was formally implemented in June 2006 under the auspices of the newly created Kansas Stream Probabilistic Monitoring Program (SPMP).

Probabilistic stream monitoring addresses 305(b) data needs, whereas targeted monitoring serves as the primary basis for 303(d) list development, TMDL formulation, and NPDES permit review and certification. Although site selection procedures for the probabilistic and targeted monitoring programs differ substantially, many field methodologies developed for the targeted programs have been integrated with little alteration into the probabilistic program. This decision has maintained methodological continuity across programs and facilitates inter-program data comparisons.

The SPMP sampling network is predicated on a random, but spatially balanced, site selection process (Kaufmann, et al. 1991, Messer, Linthurst and Overton 1991, Larsen, et al. 1994, Urquhart, Paulsen and Larsen 1998, Herlihy, Larsen, et al. 2000, Herlihy, Stoddard and Burch-Johnson, The relationship between stream chemistry and watershed lend cover data in the mid-Atlantic region, U.S. 1998). Site coordinates are based on the random selection of points from the universe of classified stream segments identified in the most recently approved version of the Kansas Surface Water Register (KSWR) (KDHE, 2010a). This register represents all potential sampling locations or "the sampling frame." It is subject to incremental change over time owing to the deletion or addition of classified stream segments (KAR, 2004; KDHE, 2012c). In effect, an infinite number of potential sampling sites can be selected from the KSWR, allowing a manageable subset of about 30–50 newly selected sites to be sampled each year. Additional details are given in the SPMP quality assurance management plan (KDHE 2016).

Figure 4. Probabilistic Stream Monitoring Sites, 2010-2014



In addition to the 30-50 probabilistically selected monitoring sites sampled each year, the SPMP maintains a network of 25-35 reference-quality stations, which are chosen to reflect least disturbed waterbody types across the full range of stream sizes, ecoregions (Chapman *et al*, 2001) and major river basins (**Figure 4**). These sites are sampled on an approximately biennial basis using the same methodologies as those used on probabilistic sites. Data from these sites are used to derive thresholds for macroinvertebrate community-structure metrics, which are then used to assess the general population.

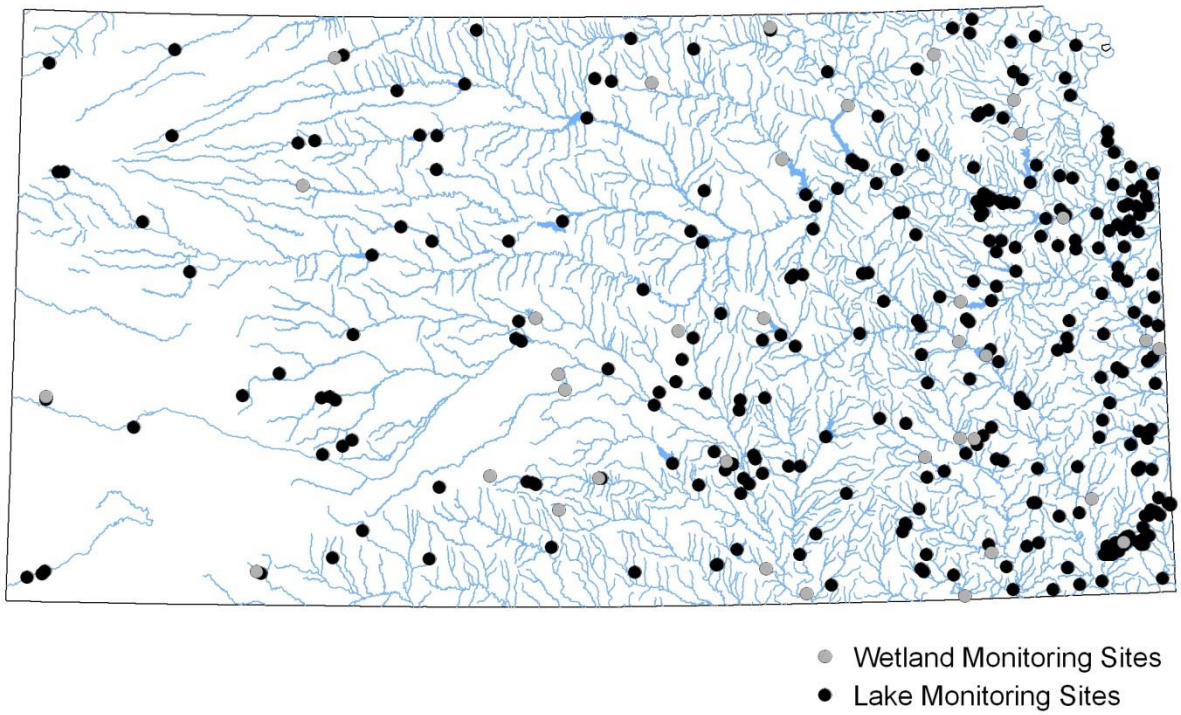
Water chemistry samples are collected on a quarterly basis at each monitoring site; see **Appendix A** for parameters. During summer low flow of the same year, SPMP staff visit each site to sample the macroinvertebrate and phytoplankton communities. Physical habitat data also are collected to help discriminate between chemistry- and habitat-mediated constrains on the biotic community. The SPMP staff also obtains permissions to access a subset 12-20 of each year's sites that are on segments designated for food procurement. In cooperation with the Fish Tissue Contaminant Monitoring Program staff, harvestable-sized edible fish are collected at these sites, and their tissue plugs are screened for mercury metals. (Note: the USEPA Regional Laboratory has discontinued analysis of other heavy metals and organic contaminants, so these are no longer assessed.)

As mentioned previously, SPMP personnel employ many field protocols developed originally for the targeted monitoring programs and continue to work closely with staff from those programs, sharing in training, sample collection, and quality control and quality assurance methods. These established protocols are robust, and their utility has been demonstrated over the course of several decades. Moreover, data comparability and consistency among monitoring programs may prove important to future statewide water quality assessments. The SPMP database currently contains over 18,800 high resolution (predominantly genus/species level) macroinvertebrate records for 2006-2014 and over 2,000 water chemistry records for the same time period. Separate databases house additional information on physical habitat, freshwater mussels, phytoplankton, and fish tissue.

IV. TARGETED LAKE AND WETLAND MONITORING PROGRAM

This program surveys water quality conditions in publicly owned and/or publicly accessible lakes and wetlands (KDHE 2014). Program personnel visit individual waterbodies on a three-to-six year rotational schedule, and field measurements and subsequent laboratory analyses provide data on a large suite of physical, chemical (inorganic and organic), and biological (phytoplankton and macrophytic communities) parameters **(Appendix A).** Macrophyte community composition and areal coverage are evaluated in selected waterbodies smaller than 200 acres. The program's primary database now contains over 400,000 analytical records representing more than 350 waterbodies. Watersheds associated with many of these lakes and wetlands are surveyed periodically with respect to prevailing land use/land cover and the location and size of discrete pollutant sources (WWTFs, CAFOs, *etc.*).

Figure 5. Targeted Lake and Wetland Monitoring Sites



As of December 2015, baseline water quality information is obtained from a dynamic ambient sampling network of 132 selected lakes and wetlands distributed throughout the state. These include all 24 federal lakes, most state-administered fishing lakes (those with open water in the majority of years), various other state, county, or locally owned lakes, several privately owned but publicly accessible lakes (primarily for water supply), and six state or federally owned wetlands. In addition to the lakes and wetlands routinely monitored in this program, other standing waterbodies have been subjected to less intensive investigation throughout the program's tenure. A number of waterbodies were evaluated from a single survey for basic water chemistry, nutrient and trophic status, and water clarity. In other cases, physicochemical and biological data were collected from surveys occurring prior to the most recent six-year rotating sampling period. Inclusion of these sites in the current assessment is limited to results tied to the trophic status of the waterbody at the time of evaluation.

Because only a small number of Kansas lakes are natural in origin, an effort has been made to identify artificial lakes in minimally disturbed/developed watersheds to serve the function of reference systems. This program routinely shares a large amount of data and expertise with other agencies and organizations involved with lake and wetland management, environmental restoration, water quality monitoring, and environmental education. Additional collaborative efforts have addressed the abatement of toxic algae blooms and taste/odor problems in public water supplies.

V. FISH TISSUE CONTAMINANT MONITORING PROGRAM (TARGETED AND PROBABILISTIC)

This program obtains information on chemical contaminant levels in fish collected from streams and lakes in Kansas (KDHE, 2013a). KDHE field staff collected the majority of samples used to provide data for this report. Additional field support was provided by the Kansas Department of Wildlife and Parks and Tourism (KDWPT) and USEPA Region 7 staff. All methyl mercury samples were analyzed by the USEPA Region 7 laboratory. Organic contaminant samples (**Appendix A**) were analyzed by the USEPA region 7 laboratory through the year 2013. Organic contaminant samples collected during year 2014 were analyzed by a private contract laboratory for chlordane, DDT, and PCBs only due to budget constraints. The fish tissue database currently comprises 23,923 records from 322 lake, stream, and river sites.

Fish tissue samples are usually obtained from 30-50 waterbodies each year, utilizing both targeted and probabilistic sampling designs. Targeted sampling efforts focus on tracking long term contaminant trends among legacy contaminants such as PCBs and chlordane, waterbodies with known or suspected contamination, existing advisory sites, and waterbodies where fish are heavily harvested by the fishing public. Probabilistic samples from streams, collected in cooperation with the SPMP, provide unbiased data in fulfillment of 305(b) reporting requirements and serve a screening function for ascertaining contaminant patterns that may potentially affect human and wildlife consumers.

KDHE utilizes data consisting of whole body composite organic contaminant samples, fillet composite organic contaminant fillet samples, and mercury fillet plug (biopsy) samples to evaluate potential human health concerns related to mercury, organochlorine pesticides, and PCBs, in part to track long term trends as well as areas with known problems (Arruda, Cringan, et al., Correspondence between urban areas and the concentrations of chlordane in fish from the Kansas River 1987, Arruda, Cringan, et al., Results of follow-up chlordane fish tissue analysis from the Kansas River 1987, KDHE 1988, KDHE 1988). Risk is calculated using standard USEPA methods (USEPA 2000, USEPA 2000). The data are utilized for issuing, rescinding, modifying, or supporting local and state-wide fish consumption advisories. The consumption advisories are published at the beginning of each year jointly with KDWPT (KDHE 2016, KDWPT 2016).

VI. SUBWATERSHED MONITORING PROGRAM

The Kansas Subwatershed Water Quality Monitoring Program (SWMP) was established in 2010 as a cooperative effort between KDHE's Watershed Management Section and existing stream monitoring programs now in the Watershed Planning, Monitoring and Assessment Section (KDHE 2014). The SWMP employs a water quality monitoring strategy that assesses nonpoint pollution on a subwatershed scale and was designed to track water quality improvement in selected HUC-12 subwatersheds over time. Monitoring efforts target specific Kansas watersheds that have active Watershed Restoration and Protection Strategy (WRAPS) project areas. All the WRAPS projects have detailed plans to address water quality impairments associated with nonpoint source pollutants identified in Total Maximum Daily Load (TMDL) evaluations. The

WRAPS plans strategically target particular geographic areas for implementation of agricultural BMPs, which are designed to directly address nonpoint source pollutants related to TMDLs. The baseline water quality data obtained from targeted subwatersheds will be compared to future monitoring data to document load reductions attributable to the implementation of BMPs. At the time of this report, the SWMP has completed five years of monitoring on the first set of fifteen subwatersheds, and a summary report is being prepared. The next set of subwatersheds is being selected, and monitoring on those sites will be implemented in 2016.

VII. COMPLIANCE MONITORING PROGRAM

As a National Pollutant Discharge Elimination System (NPDES) delegated state, Kansas has been issuing NPDES permits and conducting compliance sampling inspections since the mid-1970s. As of December 31, 2015, there were 1,031 NPDES permitted facilities in the state subject to monitoring by this program; see **Table 2.** NPDES permits contain specific and legally enforceable effluent limitations and self-monitoring requirements for flow measurement and sampling. The sampling frequency, the sample type (grab or composite), the parameter limitations, the analytical methods, and the reporting frequency are determined by the permitting agency (KDHE).

Self-monitoring data are submitted to KDHE by the permit holder at intervals and analyzed for parameters specified in the individual facility's NPDES permit. Additional parameters such as metals, nutrients, and organic compounds are frequently sampled to obtain additional information regarding effluent characteristics. Whole effluent toxicity samples have also been collected during compliance sampling. Compliance monitoring includes all field activities conducted to determine the status of compliance with permit requirements. A compliance sampling inspection will accomplish one or more of the following objectives:

- verify compliance with effluent limitations
- verify self-monitoring data
- verify that parameters specified in the permit are consistent with wastewater characteristics
- support permit re-issuance and revision
- support enforcement action

The scope of the Compliance Monitoring program is statewide. Any NPDES permit holder may be subject to compliance monitoring. Facilities are selected by KDHE Bureau of Water regulatory personnel. Program staff currently monitor 20 to 30 facilities per year. During 2014-2015, 70 site visits were made to 40 facilities. From the discharging municipal and industrial mechanical and lagoon treatment systems, 623 analytes were sampled against NPDES permit limits. Only four samples were found to be in exceedance of permit limits at the time of sampling.

Although is not known whether these observed exceedences caused or contributed to actual instream violations of Kansas Surface Water Quality Standards, the vigilance of the Compliance Monitoring Program safeguards the surface waters of the state by ensuring accountability of permitted dischargers.

VIII. SPECIAL PROJECTS

Coupled with ongoing efforts to protect the physical, chemical, and biological integrity of the waters of the state, KDHE performs special water quality investigations in support of TMDL studies to strengthen mitigative and enforcement decisions implemented by the department. KDHE began five projects directly related to wastewater treatment facilities:

1. KDHE's stream chemistry and biological monitoring programs collected ambient surface water quality samples and are examining the changes in aquatic biological integrity in Mill Creek coincident with City of Olathe's Harold Street wastewater plant rehabilitation project.

2. KDHE determined that sampling sestonic chlorophyll-a in the stream water column provides adequate information at less logistical cost than attempting to evaluate estimated periphyton concentrations from filamentous algae growing on the stream bottom using artificial substrates. Targeted streams included those associated with wastewater treatment plant upgrades aimed at reducing nutrient loading.

3. As construction is planned for new wastewater treatment plants, such as the City of Lawrence's facility on the Wakarusa River, KDHE is collecting chemical and biological data above and below the planned outfall. This establishes a baseline to evaluate the impacts of the new plant discharges into the receiving stream once operations commence.

4. KDHE also adds new biological monitoring sites on streams, such as Big Creek below the City of Hays, to evaluate improvements in wastewater nutrient removal and non-point source abatement efforts triggered by newly developed TMDLs. The biological data will be used to support evaluation of TMDL endpoints and inform the next iteration of TMDL implementation efforts by the point and non-point sources discharging nutrients to the streams.

5. KDHE directed its compliance monitoring program to sample a select number of discharging wastewater lagoon systems at their outfall, and again some distance downstream from their applicable mixing zones, to assess the water quality impact from these small town wastewater treatment systems. The data continually showed diminished concentrations of pollutants emanating from these relatively, low-tech lagoons, better defining the relative impact of small town wasteloads.

Assessment Methodology

I. 305(B) ASSESSMENT METHODOLOGY FOR STREAMS

Overview

The target population for the 2014 probabilistic stream assessment comprised that portion of the Kansas Surface Water Register (KSWR) stream extent that contained water during the summer low-flow periods of 2010-2014. The sampling frame used to select sites was drawn from a survey design based on the official February 12, 2009, KSWR. Reporting here is based on the segment geometries and uses in the proposed December 12, 2013, version of the register (KDHE 2013), which represents an extent of approximately 30,278 stream miles, based on a 1:24K resolution. This includes perennial rivers and streams as well as intermittent streams that provide important refugia for aquatic life.

The survey design was generated by the USEPA design team in Corvallis, Oregon (Olsen, Kansas statewide stream survey design. March 11, 2009. 2009), using the methods and assumptions of Stevens and Olsen (Stevens and Olsen, Spatially balanced sampling of natural resources 2004). All desk and field reconnaissance was performed by SPMP personnel, along with securing landowner permissions. The target population was determined to comprise 19,257 stream miles, or about 64% of the KSWR. Data collected during 2010-2014 were used to assess the prevailing level of support for CWA section 101(a) uses (**Table 5**). A few probabilistic sites from the 2013-2014 National Rivers and Streams Assessment were also included; these are based on the same target population and compatible with the state survey design.

The likely capacity of a given stream reach to provide for recreation, food procurement, and aquatic life support was determined by considering the local water chemistry, fish tissue chemistry, suspended bacterial concentrations, and condition of the benthic macroinvertebrate community. Monitoring sites meeting the applicable water quality criteria or diagnostic thresholds for a given use were deemed "fully supportive" of that use. Any site failing to meet these criteria or thresholds was deemed "non-supportive" of the use. Note that the quantity of data and assessment methodologies used here are sufficient for a screening-level assessment for 305(b) purposes, but are not sufficient to support a 303(d) impairment listing or to issue state advisories or warnings.

Table 5. Types of data applied to assessment of designated use support for streams and rivers, 2010-2014

Designated Use	Macroinvertebrate Community Structure	Water Chemistry	*E. coli* Concentrations in Water Samples	Mercury in Fish Tissue
Aquatic Life	X	X		
Recreation			X	
Food Procurement				X
Overall	*X*	*X*	*X*	*X*

Causes and sources of nonsupport cannot be known definitively, but were inferred and assigned

conservatively using best professional judgment and a variety of data sources. Data sources and considerations included: prevalence and proximity of upstream point sources, nonpoint sources, spills, construction, and any other relevant anthropogenic activities or influences, point source performance during the reporting period (if known), dominant land uses within the watershed and near the sampling location, chemical profiles of water samples, and any instream manifestations reflecting degraded water quality (substrate characteristics, bank instability, algal overgrowth, presence or recent evidence of livestock in the stream channel, effluent odors, *etc.*), along with considerations of any known recent extreme weather events, such as drought or flood.

Causes have been assigned at the most proximal identifiable level (*i.e.*, the most directly observable condition), and sources are the anthropogenic and environmental stressors to which the conditions may be most logically attributed. Sources, too, were assigned at the lowest causal level possible, to minimize the degree of uncertainty in conclusions.

Aquatic Life Use

The aquatic life use assessment considered stream macroinvertebrate data and water chemistry data from 164 randomly chosen sites (**Figure 4**). A site was deemed fully supportive for aquatic life only if both the macroinvertebrate community structure and the water chemistry indicated support.

In assessment of the macroinvertebrate community, primary use support was determined using the raw site scores for four of the biological metrics used by the Stream Biological Monitoring Program. These metrics are: macroinvertebrate biotic index (MBI), nutrient-organic Kansas biotic index (KBI-NO), Ephemeroptera-Plecoptera-Trichoptera index (EPT), and percent EPT specimens with respect to total macroinvertebrate abundance (%EPTCNT). (Huggins and Moffett, 1988). A fifth metric, Total Taxa (TOTTAX), was used as a tiebreaker when other metrics were equivocal.

Support thresholds for these metrics were derived from an analysis of 47 reference streams, all sampled during the 2008-2011 assessment period (**Figure 4**). Reference and probabilistic sites were partitioned into three streamflow categories (<10 cfs, n=23; 10 to 99 cfs, n=17; and ≥100 cfs, n = 7) using 10-year median discharge estimates for the KSWR segment on which each site falls (Perry *et al.*, 2004). Within each flow category, support thresholds for the biological metrics were set at the 75th percentile (MBI and KBI-NO) or 25th percentile (EPT, %EPTCNT, and TOTTAX) reference site score, which is a standard method for threshold setting (http://www.epa.gov/bioindicators/html/biological_endpoints.html). This procedure effectively adjusted the expected performance of each monitored stream reach on the basis of stream size, *e.g.*, a small stream would not be expected to support the same number of EPT taxa as a large river, but it would be expected to perform as well as a similarly sized stream in the absence of environmental stressors. Support thresholds derived from this process are presented in **Table 6.**

Table 6. Aquatic life use non-support thresholds for biological metrics across three stream classes

Flow Group	MBI	KBI	EPT	%EPTCNT	TOTTAX +
< 10 cfs	> 4.90	> 2.86	< 6	< 29	< 34
10-99cfs	> 4.65	> 2.69	< 8	< 37	< 38
≥ 100 cfs	> 4.56	> 2.66	< 11	< 47	< 35

+ secondary metric

Scores for probabilistic sites were compared to the flow-adjusted thresholds and assigned a value of 0 (non-support) or 1 (full support). These values were averaged across the four primary metrics to obtain a final average value for each site. If an average support value exceeded 0.5, the site in question was deemed fully supportive of the aquatic life use. If an average value was less than 0.5, the site was considered non-supportive of the aquatic life use. If an average value was exactly 0.5, the "total taxa" metric was used as a tiebreaker to determine support.

Water quality was also used to determine aquatic life support. Kansas has separate numeric water quality criteria for chronic versus acute water quality conditions as they relate to aquatic life (KDHE 2012). Data were scored against both sets of criteria. Exceedences of chronic water quality criteria for inorganic parameters were excluded if they were determined to have occurred during unstable-flow periods. Natural background concentrations of certain parameters, *e.g.*, chloride or sulfate, for individual stream segments, if applicable, were also taken into account during scoring of exceedences. (These are the same values used in approved TMDLs). If pollutant or parameter concentrations were found to exceed a given acute or chronic aquatic life criterion in greater than 25% of samples, the site in question was deemed non-supportive of the aquatic life use.

Contact Recreation Use

All probabilistic sites were assessed for recreational use support based on measured suspended concentrations of *Escherichia coli*. This bacterium is part of the normal intestinal fauna of humans and many other warm blooded animals. It is utilized in many water quality studies as a general indicator of fecal contamination. For formal (*e.g.*, 303(d)) regulatory purposes, bacteriological criteria generally are applied as geometric mean concentrations, calculated using data from at least five different samples collected in separate 24-hour periods during a 30-day assessment window (K.A.R. 28-16-28d-e). The frequency and timing of the SPMP sample collections did not meet these rigid requirements. Therefore, the results reported below for the state as a whole (*i.e.*, pursuant to section 305(b) of the CWA) were based on seasonal samples collected from each probabilistic site over the course of a single year.

Based on studies use assessment studies performed by KDHE (mostly from 2001 to 2009), each stream segment listed in the KSWR has been assigned to one of four recreational use categories, two primary and two secondary, depending on stream size, extent of public access, and other use attainability considerations (KDHE, 2012c). *Escherichia coli* data from each probabilistic site were compared to the applicable criterion concentration. Many of these sites were designated for secondary contact recreation only, in which case all available data were combined and the geometric mean was compared directly to the appropriate criterion concentration. Sites designated for primary contact recreation were evaluated with respect to recreational season

(primary contact, April 1 – October 31; secondary contact, November 1 – March 31), and the geometric mean for each season was compared to the appropriate criterion concentration (**Table 7**). If the geometric mean exceeded the applicable criterion concentration during the recreation season, it was considered a "fail," and the monitoring site in question was deemed non-supportive of the recreational use.

Table 7. *Escherichia coli* criteria used in recreational use assessments

Use	Colony Forming Units (CFUs)/100mL	
Primary Contact Recreation	Geometric Mean April 1 – Oct. 31	Geometric Mean Nov. 1 – March 31
Class B	262	2,358
Class C	427	3,843
Secondary Contact Recreation	Geometric Mean Jan. 1 – Dec. 31	
Class a	2,358	
Class b	3,843	

Food Procurement Use

Of the 164 probabilistic stream sites sampled during 2010-2014, 140 fell on segments designated or proposed for food procurement and thus were regarded as viable candidates for collection of harvestable size and species of fish. However, until 2015, USEPA Region 7 laboratory analysis capacities limited sampling to about 15 sites per year. Thus, fish tissue samples were obtained from 76 of the 140 candidate sites (**Figure 4**). At each site, personnel endeavored to collect one composite (three- to five-fish) sample of a representative bottom-feeding fish species (*e.g.*, channel catfish, common carp) and another composite sample of an open-water predatory species (*e.g.*, largemouth bass). Through 2011, the USEPA Region 7 laboratory analyzed tissue based on composite fillet samples. In 2012, some samples were composite fillets and some were plugs. Beginning in 2012, however, the laboratory began accepting only tissue plugs for mercury. Thus, this particular assessment is based partly on fillet and partly on plug data. Non-carcinogens such as mercury are evaluated using USEPA health endpoints for chronic systemic effects. Assumptions for risk calculation included consumption of fish tissue over the duration of an average human lifetime, average adult body weight, and eight-ounce meal portions.

For measurements based on a composite sample, the following rule was used: if the composite value for either top predators or bottom feeders exceeded the threshold concentration, the site failed. For measurements based on individual plugs, the following rule was used: Both an average and a median were calculated for top predators from a given site, and these values were also calculated for bottom feeders. If any of these four values (*i.e.*, the mean or median concentration in either sample) was found to surpass the applicable threshold concentration, the site in question was deemed non-supportive of the food procurement use.

Population Extent Estimation

Data from the 164 sites assessed for aquatic life and contact recreation and from the 76 sites assessed for food procurement were used to derive estimates for the target population as a whole. If a site failed to support any single designated use, it was considered non-supportive overall.

The design team at the USEPA Western Ecology Division provided the population extent and variance estimates given in this report (personal communication, Tom Kincaid and Tony Olsen). Calculations were performed using the "R" programming environment (http://www.r-project.org) the most current "sp" and "spsurvey" custom software modules (http://www.epa.gov/nheerl/arm), and the methods and assumptions of Diaz-Ramos, Stevens, and Olsen (Diaz-Ramos, Stevens and Olsen 1996, Stevens and Olsen 2003).

II. 305(B) AND 314 ASSESSMENT METHODOLOGY FOR LAKES AND WETLANDS

This targeted monitoring program assessed 322 publicly owned and/or publicly accessible lakes, plus a total of 36 publicly owned and/or publicly accessible wetland areas (**Figure 5**). For all chemical and physical features, the most recent six year period of record was utilized (2010 to 2015 data). For biological/trophic state features, the entire period of record was utilized so that some estimate of trends could be provided. All lakes and wetlands listed in the Kansas Surface Water Register have had use attainability analyses (UAAs) completed for all possible designated uses.

Chemical data for the six year period were subjected to a comparison to the current water quality standards to identify exceedances of those water quality standards. A lake or wetland was deemed non-supportive of a designated use if more than 25% of the samples exceeded a given criterion associated with that use, partially supportive if more than 10% (but ≤25%) of the samples exceeded the criterion, and fully supportive if ≤10% of samples exceeded the criterion. Only data from epilimnetic samples were used in the assessment.

Table 8. Mean chlorophyll-a thresholds used as support criteria for six designated uses

Support Level	If Waterbody is Active or Emergency Public Water Supply *Designated Use for:* -Primary Contact Recreation -Domestic Water Supply	If Waterbody is not Public Water Supply *Designated Use for:* -Primary Contact Recreation -Domestic Water Supply	*Designated use for:* -Irrigation -Livestock Watering -Secondary Contact Recreation -Aquatic Life
Fully supportive	<8 ug/L	<10 ug/L	<18 ug/L
Fully supportive but threatened	(N/A)	10-12 ug/L	18-20 ug/L
Partially supportive	8-20 ug/L	12-20 ug/L	20-30 ug/L *or* 20-56 ug/L without blue-green algal dominance of the phytoplankton community
Non-supportive	>20 ug/L	>20 ug/L	>30 ug/L with blue-green algal dominance *or* >56 ug/L regardless of algal community composition

Biological/trophic state data were converted to a mean concentration of chlorophyll-a for each waterbody based on the period of record for that waterbody. Concentrations were compared to an existing set of thresholds used to interpret narrative standards for lake trophic state, nutrient

enrichment, and turbidity (KDHE, 2005). Mean chlorophyll-a thresholds for the support of several designated uses are shown in **Table 8.**

III. 303(d) Assessment Methodology

Overview

The 2016 list of impaired (Category 5) waters builds upon listings developed in 2014. A complete description of the procedures and assumptions applied during the preparation of this list is provided by the report, "Methodology for the Evaluation and Development of the 2016 Section 303(d) List of Impaired Water Bodies for Kansas," which reflects the state's submissions as of March 28, 2016. is published at http://www.kdheks.gov/tmdl/methodology.htm.

Development of the 2016 list relied primarily on data from targeted water quality monitoring programs administered by BOW and described elsewhere in this report. The statewide water quality assessment prepared by BOW pursuant to section 305(b) of the CWA also provided initial waters for listing lakes and wetlands, and long-term routine targeted monitoring of stream chemistry and stream biology provided initial data for listing streams. BOW then performed more extensive follow-up analyses, particularly on stream chemistry and stream biology, as the final basis for identifying and listing impaired waters in Kansas.

Stream chemistry data were obtained from the statewide network of targeted permanent monitoring stations (assessment period 2000 through September 30, 2015) and rotational stations (assessment period 1990 through September 30, 2015, except toxics which were assessed July 1, 2002, through September 30, 2015). To assess the chronic category of aquatic life, analysis for conventional pollutants generally used binomial techniques, adjusted to minimize Type II errors. Analysis for the aquatic life acute category or for toxics (acute or chronic), impairment is indicated by the frequency of digressions greater than once every three years. Streams suspected of being impaired by excessive total phosphorus or total suspended solids were identified by median concentrations exceeding screening values. Table 5 in the methodology details the assessment methodology for specific pollutants based on their designated use.

Watersheds monitored by the individual stream chemistry stations comprise multiple stream segments as an assessment unit for the purposes of the 303(d) program. Waters flowing directly into some large reservoirs were not surveyed as part of the stream chemistry monitoring network, instead being assigned to the assessment unit associated with that reservoir.

The public notice for the 2016 draft 303(d) list provides a mechanism for soliciting all readily available and existing water quality data from other agencies. In most cases, any submitted data corroborated the conclusions reached from the corresponding KDHE data. The public comment period ended March 23. No comments were received from the public which required modification of the list. The final 303(d) list, submitted to USEPA effective March 28, 2016, identifies 500 station/pollutant Category 5 water quality impairments encompassing approximately 2500 stream segment/pollutant combinations.

Priorities and Schedules; Introduction of the Kansas TMDL Vision

Since 1999, TMDL development efforts in each of the state's 12 major river basins have attempted to adhere to a five-year rotational schedule. With the emergence of a Kansas TMDL Vision, consistent with the approach supported by USEPA's national TMDL Program, significant alteration in scheduling has been made for the years 2014- 2022. Kansas TMDL Vision is tied to KDHE's Nutrient Reduction Framework and will concentrate on stream phosphorus or nitrate impairments within 16 HUC8's deemed as high priority. The 2016 303(d) list identifies streams in the Kansas Lower Republican and Lower Arkansas HUC8 sub-basins with excessive total phosphorus as slated for TMDL development in 2016 and 2017.

Streams in other priority HUC8's will have stream phosphorus TMDLs developed over 2016-2022. As time permits, secondary impairments caused by excessive nutrients including pH, low dissolved oxygen, or lake eutrophication may also have TMDLs developed within the priority 16 HUC8 sub-basins. This priority schedule means that no TMDL development will be conducted in other basins of the State, particularly those in western Kansas. Additionally, impairments other than nutrients will not be addressed during 2014- 2022. The framework for Kansas'303(d) prioritization under the national TMDL Vision is available at: http://www.kdheks.gov/tmdl.

Tracking Previously Listed Waters

The 2016 303(d) list also identifies waters from previous lists that were once impaired by a pollutant (Category 5) but that are now placed in other listing categories established by USEPA. Waters with approved, established TMDLs are placed in Category 4a. Such waters in Kansas were cited as impaired on the 1998, 2002, 2004, 2008, 2010, 2012, or 2014 303(d) lists; these are published at: http://www.kdheks.gov/tmdl/planning_mgmt.htm. These waters remain impaired but now have a TMDL established for them, hence their removal from Category 5.

A small number of water bodies have been designated as Category 4b, meaning their particular impairments have been addressed by some means other than development of a TMDL. Previous Category 4b waters addressed through the appropriate limits, schedules of compliance, and other conditions placed on NPDES permits are now achieving the respective water quality criteria and have been placed in Category 2, which is reserved for those Kansas waters that were once impaired, but whose water quality has subsequently been restored to meet standards. Effluent quality data from individual facility discharge monitoring records, corresponding water quality data at downstream monitoring stations, and special monitoring efforts upstream and downstream of selected facility outfalls support the transfer of those waters to Category 2.

Atrazine impairments in a limited number of water bodies in the Little Arkansas River watershed have been addressed through implementation of a WRAPS watershed plan. Continuation of Category 4b status is contingent upon ongoing efforts and results to abate atrazine loads in the selected subwatersheds of the Little Arkansas River. Because of the burden of proof placed on designated waters into Category 4b, it is unlikely that additional entries will be made into that category. Other WRAPS groups may address impairments through implementation of their watershed plans, but the impaired waters will remain in Category 5 until those impairments are remedied or a TMDL has been established.

A few stream systems in Kansas have been designated as Category 4c, which is used for waters impaired by factors other than pollutants (such as slurry spills, habitat limitations, or flow alterations). Biological impairment as defined by macroinvertebrate monitoring appears to be linked to pervasive low flows during drought, perhaps exacerbated by water diversions. The impairment is better suited for management through water allocation and water rights administration.

Category 3 is used by Kansas when there is uncertainty as to the impaired status of a given water body. Insufficient data exist to determine if the water is newly impaired, now restored, or continues to be impaired. Relatively new stations with small sample sizes would be placed in this category as would previously impaired waters that now are just barely compliant under the applicable analysis using recent data. Additional monitoring and subsequent analysis in coming listing cycles will move waters from Category 3 into Categories 2, 4a or 5.

Waters are placed in Category 2 as a result of successful restorative implementation, updated data, changes in water quality criteria, or the removal of certain designated uses through the Use Attainability Analysis process. In some cases, corrective actions on point and non-point sources of the pollutant have improved conditions to restore the applicable water quality standard. Ammonia and chlordane are two pollutants that reflect cases in which point source improvements (lowered ammonia) or an outright ban (chlordane in 1988) have resulted in measureable improvements in ambient stream concentrations, fish tissue concentrations, and biological monitoring results.

Any surface water that has not been cited as impaired in the past or present is designated as Category 1, signifying that all its designated uses are being fully supported. All category assignments are recorded by KDHE in electronic databases, with the most recent revision tied to the 2016 listing process and submitted to KDHE as part of the 2016 integrated report and 303(d) listings package.

Assessment Results

I. 305(B) Assessment Results for Streams and Rivers (Probabilistic Data)

The draft 2013 Kansas Surface Water Register identifies all currently classified stream segments in Kansas (KDHE, 2013c). Represented at 1:24,000 resolution, these collectively represent about 30,278 stream miles and include both perennial and intermittent waters. During prolonged droughts, some of this mileage is expected to be nonviable for sampling purposes. In addition, any given intermittent segment may not contain sampleable water at a randomly-chosen point along its length, especially during summer low-flow. Thus, the target sampling population is restricted to those reaches on classified stream segments that contain substantive aquatic habitats during the assessment period of interest. These habitats may include continuously flowing reaches, continuously wetted but non-flowing reaches, or isolated pools deemed capable of providing refugia for aquatic life.

Table 9. Probabilistic stream assessment fact sheet

Project Name	Kansas stream probabilistic monitoring program
Type of Waterbody	Stream or river
Units of Measurement	Miles
EPA Survey Design Project IDs	KS2010 and NRSA 2012-2013
Sample frame for assessment	Dec 12, 2013 edition of Kansas Surface Water Register
Designated Uses	Aquatic life, contact recreation, and food procurement +
Size of sample frame	30,278 miles for Aquatic Life and Contact Recreation 22,235 miles for Food Procurement
Size of Target Population	19,257 miles for Aquatic Life and Contact Recreation 16,215 miles for Food Procurement +
Percent supporting all uses assessed	23.4 % ± 6.9%
Percent failing to support at least one use	76.6 ± 6.9%
Percent nonresponse	0%
Indicators	Macroinvertebrate community assessments, water chemistry analyses, fish tissue mercury analyses, *E. coli* measurements
Assessment Date	January 8, 2016
Precision	95%

+ Food Procurement Use applies to only 73% of the Kansas Surface Water Register. For this assessment period, however, it applied to 84% of the target population. This is most likely due to the underrepresentation of headwater & intermittent streams during drought periods.

Based on combined desk and field reconnaissance, the target sampling population during the summers of 2010-2014 was estimated at 19,257 stream miles or approximately 64% of the total classified stream mileage on the KSWR. This extent was assessed for recreational and aquatic life support uses with chemical and biological data from 164 monitoring sites. As discussed previously, the food procurement use was assessed using fish tissue contaminant data from 76 sites. **Table 9** highlights some of the major features of the probabilistic sampling effort.

STREAM USE SUPPORT IN RELATION TO INDIVIDUAL DESIGNATED USES

The uses of surface water recognized in section 101(a) of the CWA correspond to the following three designated uses in Kansas: aquatic life support, recreation, and (human) food procurement (K.A.R. 28-16-28b *et seq.*). The first two uses apply in some form to all classified streams in the state. The food procurement use, on the other hand, is assigned only to a portion (73%) of the state's classified stream mileage – those rivers and streams that have been determined likely to contain edible fish of harvestable size. The Kansas surface water quality standards recognize additional uses for surface waters (**Table 10**), but support for those uses is not evaluated explicitly in this probabilistic assessment.

Table 10. Allocation of designated uses among classified streams

Designated Use	Proportion of Mileage Designated for Use +
Aquatic life support (any category)	100%
Contact recreation (any category)	~100% ++
Food procurement	73%
Livestock watering	96%
Irrigation	92%
Groundwater recharge	92%
Industrial water supply	74%
Domestic water supply	72%

+ Mileage given relative to the entire December 12, 2013 KSWR extent of 30,278 miles
++ The few streams with no formal use designation for contact recreation (<0.5% of total mileage) were assessed here using the least restrictive (class b) criteria.

Table 11 presents use support findings for individual section 101(a) uses (aquatic life support, contact recreation, and food procurement), and **Table 12** illustrates overall support as well as the overlap among support and non-support for all three uses. The indicated 95% confidence intervals were derived using a local variance estimator approach (Stevens and Olsen, 2003). Although only about 23% of mileage supported all three assessed uses, less than 3% of mileage failed all three uses. Most stream mileage in Kansas supported one or two of the three assessed designated uses.

Table 11. Support of individual designated uses in streams (in miles)

Designated §101(a) Use	Total Sample Frame Extent	Total Targeted & Assessed Extent	Extent Supporting Indicated Use*	Extent Not supporting Indicated Use*	Extent with Insufficient Data
Aquatic Life	30,278	19,257	6,772 ± 1,176	12,485 ± 1,176	0
Contact Recreation	30,278	19,257	17,382 ± 724	1,875 ± 724	0
Food Procurement	22,215	16,215	9,359 ± 1,704	6,856 ± 1,704	0
ALL USES COMBINED	30,278	19,257	4,497 ± 1,338	14,760 ± 1,338	0

Note: where estimated variance appears to exceed the estimated value, the lower 95% confidence bound is actually zero. 95% confidence intervals were derived using local variance estimator approach (Stevens and Olsen, 2003) Food procurement monitoring was based on a subsample rather than an exhaustive sample, but it was assumed for extent estimation purposes that nonsampled sites were a random subset of the population and thus would not differ in quality from those where samples were taken.

Although this document reports confidence interval estimates only for 101(a) uses of the CWA, the stream water quality data do provide an opportunity to assess basic support for other uses. In particular, the two agricultural uses, Livestock Watering and Irrigation, are important to Kansas. Of the 164 sites sampled for water quality, 99% supported the Livestock Watering use, and 99% supported the Irrigation use. Excursions from those criteria involved presence of elevated chloride, sulfate, and selenium.

Table 12. Detailed account of use support for streams (in miles)

		Food Procurement Support	Food Procurement Non-support
Aquatic Life Support	Contact Recreation Support	4,497 ± 1338 (23%)	1,580 ± 798 (4%)
	Contact Recreation Non-support	0 (0%)	695 + 1,121 (4%)
Aquatic Life Non-support	Contact Recreation Support	7,187 ± 1,502 (37%)	4,117 ± 1,437 (21%)
	Contact Recreation Non-support	717 ± 592 (4%)	463 ± 520 (2%)

Note: where estimated variance appears to exceed the estimated value, the lower 95% confidence bound is actually zero.

Causes and Sources of Stream Impairment

Likely causes and sources of non-support were determined for each probabilistic monitoring site exhibiting water quality impairments. This phase of the water quality assessment used habitat data collected on-site, water chemistry profiles, and aerial photographs along with geographical map coverages identifying watershed boundaries and water resources, point and nonpoint sources of pollution, general land use and land cover. Findings were extrapolated to the overall population of streams targeted during the 2008-2014 assessment period. Because some individual monitoring sites were subject to multiple causes and sources of impairment, there is overlap among their extents, and thus the stream mileage affected by all causes and sources is not amenable to traightforward summation.

Two major causes of non-support for streams were aquatic macroinvertebrate community metrics and mercury in fish tissue. Other directly-measured water quality parameters (high metals, biocides, bacteria, *etc*.) combined to form an additional functional stressor category; see **Table 13.**

Table 13. Major causes of water quality impairments in streams (in miles)

Cause category	Cause (with ATTAINS cause code)	Impaired Mileage
Water chemistry	Aldrin (96)	116 ± 187
	Atrazine (148)	2,244 ± 760
	Copper (435)	116 ± 192
	Lead (663)	358 ± 353
	Selenium (984)	2,013 ± 537
	Dissolved oxygen (449) [too low]	1169 ± 601
	pH (891) [too high or too low]	116 ± 186
Waterborne pathogens	*Escherichia coli* contamination (471)	1,875 ± 724
Biological assessment	Aquatic macroinvertebrate bioassessment (135)	10,263 ± 1,244
Fish tissue chemistry	Mercury in fish tissue (696)	6,586 ± 1,704

Sources responsible for pollutant loadings and/or use impairments can be separated into four

general categories. The most prevalent of these was general anthropogenic influence (*e.g.*, erosion and sedimentation, atmospheric deposition of contaminants), followed by identifiable agricultural influences (from both crop and livestock production), and other factors (including natural sources and unknown sources). Urban influences (both point and nonpoint) comprised a relatively minor source of use nonsupport; see **Table 14.**

Table 14. Major sources of water quality impairments in streams

Source Type	Source	Impaired mileage
Agricultural	Crop related sources (45)	3,529 ± 938
	Agricultural return flows (340)	1,897 ± 497
	Livestock (510)	1,528 ± 672
	Agricultural nonpoint source (19)	579 ± 427
Urban	Municipal point sources (93)	590 ± 441
	Domestic waste, unspecified (192)	347 ± 336
	Urban runoff (518)	347 ± 327
General anthropogenic	Atmospheric deposition (109) [mercury]	6,856 ± 1,704
	Erosion and sedimentation (56)	4,312 ± 990
	Eutrophication (189)	3,794 ± 991
	Spills (504)	504 ± 501
	Water withdrawal (358)	116 ± 186
Other	Poor habitat (426)	3,838 ± 989
	Source Unknown (2922)	2,107 ± 765
	Natural or wildlife source (546)	116 ± 203

Kansas suffered from significant drought for over half of the monitoring period reported here. The drought of 2012-2013 was particularly severe. For several months, 100% of the land area of Kansas was under severe to exceptional drought
Figure **6**) (National Oceanic and Atmospheric Administration 2016).

What follows is a summary of Kansas Annual Drought Reports from 2010 to 2014 (Kansas Water Office 2010-2014) and related data (Diane Knowles, Kansas Water Office, pers. comm. January 2016):

- In 2010, statewide precipitation was 103% of normal, but this was not distributed normally. There was flooding in some areas, but by fall, 82% of the state was in at least moderate drought.
- In 2011, statewide precipitation was 89% of normal; the drought worsened overall in intensity and extent, with severe to exception drought in the southwest; some emergency water conservation and use plans were initiated.
- In 2012, statewide precipitation was only 71% of normal, and the entire state was in severe to exceptional drought, with a number of grass fires. The entire state was in drought emergency state from July 2012 to August 2013.
- In 2013, precipitation was 106% of normal, but it arrived during summer, rather than spring and fall. The western part of the state remained in drought, but conditions improved somewhat in the east. In 2014, statewide precipitation was 95% of normal, but streamflows were still below normal for all but the eastern part of the state.

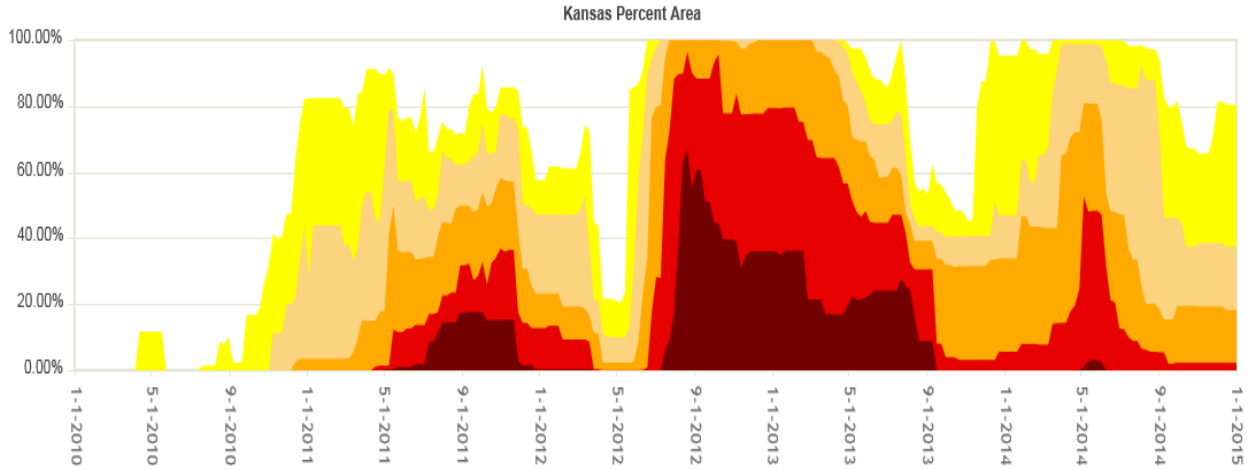


Figure 6. Percent land area of Kansas affected by drought 2010-2014
Extracted from the United States Drought Monitor website, droughtmonitor.unl.edu. Author: Brian Fuchs, National Drought Mitigation Center. Color coded for severity: Yellow: D0 (Abnormally Dry) / Peach: D1 (Moderate Drought) / Orange: D2 (Severe Drought) / Red: D3 (Extreme Drought) / Maroon: D4 (Exceptional Drought)**.**

Streamflow is affected by both surface runoff and subsurface/groundwater flow, and these lag precipitation events by varying time frames. If a stream has been scoured by flooding or dried by drought, recolonization by aquatic communities also requires time. Even so, these severe weather events appear correlated to the condition of aquatic macroinvertebrate communities (**Figure 7**). It is thus surmised that the drought and other weather-related events contributed to many of the stream impairments documented during this period.

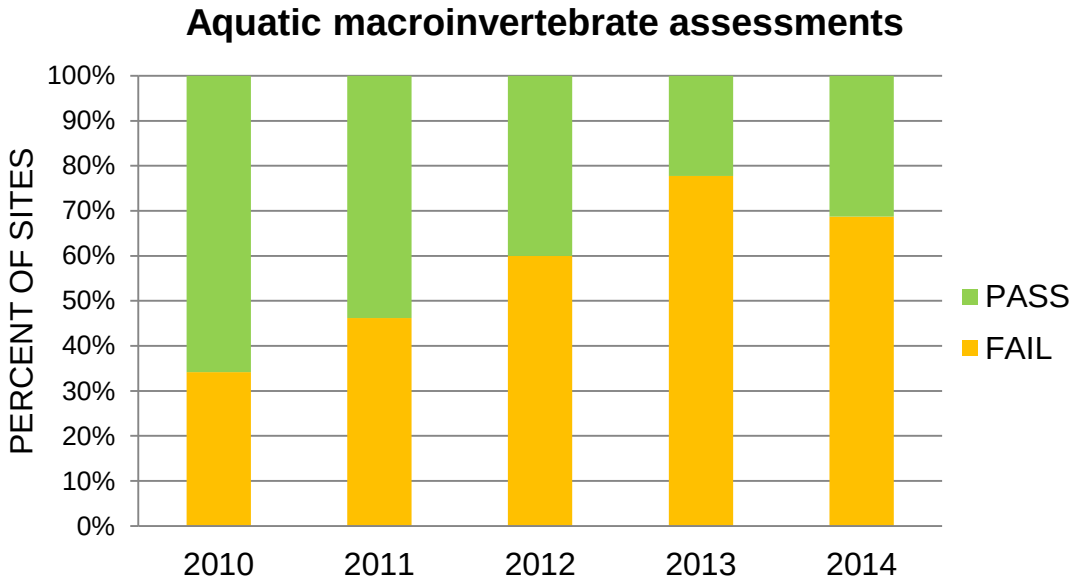


Figure 7. Aquatic macroinvertebrate community status, shown by sample year

Although this assessment indicates that many stream systems may be in suboptimal or impacted condition, it also suggests that they have capacity for improvement when streamflow conditions

return to normal. Mitigation of major identifiable stressors could also result in restored stream health and greater resilience

II. 305(B) AND 314 ASSESSMENT RESULTS FOR LAKES AND WETLANDS

Lakes Assessment

Background

A total of 322 publicly owned or publicly accessible lakes are included in this reporting cycle. This represents all registered lakes known to KDHE through monitoring activities, as well as from sources published by other agencies, most notably KDWPT and the US Army Corps of Engineers (USACE). These lakes comprise an estimated total of 190,445 acres of surface area at normal conservation pool levels. Lakes with their shorelines under common private ownership are considered private lakes in Kansas, but may still be public waterbodies under state water quality standards if they supply public drinking water or are open to the general public, by invitation or fee, for recreational use.

For the purposes of this report, all publicly owned/accessible lakes, reservoirs, and ponds are referred to as "significant" public waterbodies. This is based on the assumption that any lentic waterbody that is owned by, or accessible to, the general public will provide benefits to the general population. These benefits may include recreation and water supply, but will also certainly include habitat for the support of indigenous aquatic and semi-aquatic organisms, including fish and migratory waterfowl.

Unless specifically identified as a wetland, all lentic waterbodies are referred to as "lakes" within this report, regardless of size or origin. This is done in order to avoid the arbitrary thresholds separating ponds from other waterbodies, and to recognize the fact that we assign and expect the same benefits from constructed lakes as we do from naturally formed ones.

Table 15 presents a comparison of lake acreage assessed for this 305(b) reporting cycle versus the means by which Aquatic Life Use Support (ALUS) assessments were determined. Assessments utilize a period of record of six years for physical/chemical data and the entire period of record for trophic state data for trends. At all monitored lakes, surveys include biological, chemical, and physical data components, which also factor into metrics related to habitat. Monitored sites are those that have sampling events in multiple years with at least one event occurring within the most recent six-year time period. Evaluated sites are those with either all sampling occasions occurring prior to the most recent 6-year sampling period or any site with only a single sampling event. An additional 13 classified lakes comprising 1,568 acres are included in this assessment, but have no trophic state data and no recent (6-year) physical/chemical assessment. The majority of lake acreage is monitored, as can be seen in **Table 16**.

Table 15. Categories of data used in ALUS assessments for lakes (in acres)

Degree of Aquatic Life Use support (acute criteria)	Acres assessed using only biological data	Acres assessed using only chemical data	Acres assessed using biological and chemical data	Total acres
Insufficient Data	N/A	N/A	N/A	1,568
Fully Supported	9,538	0	96,927	106,465
Fully Supported but Threatened	184	0	18,500	18,684
Partially Supported	4,108	0	37,033	41,141
Not Supported	1,128	0	21,459	22,587
Total acres	16,526	0	173,919	190,445

Impaired and Threatened Lakes

Table 16 summarizes overall use support ratings for lakes assessed during this 305(b) cycle. Table 17 divides assessments into specific beneficial uses. Fully 91 percent of reported lake acres are considered to be monitored and, thus, are monitored for "toxics" such as heavy metals and pesticides as well as the other inorganic and biological parameters common to KDHE lake surveys. Of the 173,919 monitored lake acres, 11,682 acres (6.7%) show some level of impairment from heavy metals and/or pesticides.

Table 16. Summary of Fully Supporting, Threatened, and Impaired Lakes

DEGREE OF USE SUPPORT	Assessment Category		Total acres
	Evaluated	Monitored	
Insufficient Data	N/A	N/A	1,568
Fully Supporting of All Uses	2,154	52	4,539
Threatened for One or More Uses (But Not Impaired for Any Uses)	883	171,482	1,244
Impaired for One or More Uses	11,921	173,919	183,094
Total Size Assessed	16,526	2,385	190,445

Table 17. Individual use summary for lakes (in acres)

Goals	Use	Size Assessed	Fully Supporting	Fully supporting but threatened	Partially Supporting	Non Supporting	Insufficient Data
Protect and Enhance Ecosystems	Aquatic Life (acute criteria)	190,445	106,465	18,684	41,141	22,587	1,568
Protect and Enhance Public Health +	Fish Consumption++	190,445	188,314	0	530	33	1,568
	Primary Contact	190,317	46,715	1,061	112,491	28,592	1,458
	Secondary Contact	190,436	141,596	18,684	25,141	3,456	1,559
	Domestic Water Supply	188,924	17,100	20,782	112,218	37,414	1,410
Social and Economic Enhancement +	Irrigation	190,077	141,502	18,231	25,141	3,793	1,410
	Livestock Water Supply	190,092	134,421	18,684	26,807	8,770	1,410

+ = Shellfishing and Cultural Use categories not applicable
++ = Based on food procurement criteria for water

Table 18 presents information related to direct and indirect causes of water quality impairments for this reporting cycle, and **Table 19** presents similar information regarding sources. Code numbers associated with causes and sources are the most applicable ATTAINS codes listed. In some cases, an exact and most appropriate single code number could not be settled upon. In those cases, several code numbers appear with the cause or source category. The tabular data should be viewed as applicable to a combination of two, or more, of the codes indicated.

Table 18. Total lake area impacted by various cause categories (in acres)

CAUSE CATEGORY AND CODES	ACRES BY CONTRIBUTION TO IMPAIRMENT	
	MAJOR	MODERATE/MINOR
Pesticides – atrazine (148)	402	0
Heavy Metals – arsenic (145)	33	1,074
Heavy Metals – copper (345)	130	0
Heavy Metals – lead (663)	1	2,875
Heavy Metals – selenium (984)	0	6,800
Heavy Metals – mercury (693)	0	530
Fluoride (555)	450	205
Nutrients and Eutrophication (483 and 746)	36,569	104,519
High pH (620)	158	26,137
Low pH (678)	0	10
Siltation and Turbidity (995)	33,807	18,067
Low Dissolved Oxygen (674)	100	573
Chloride (272)	0	12,548
Sulfate (1016)	257	36,875
Flow Alterations (546)	0	17,860
Aquatic Plants (481 and 140)	2	263
Zebra Mussels (1168)	12,964	103,498

For the most part, the results for this reporting cycle are very similar to the results reported in past 305(b) cycles. Nutrient and eutrophication related impacts dominate the list of water quality problems, along with secondary effects of eutrophication, with agriculture, urban runoff, natural sources, and point source nutrient loads being the most dominant sources.

Invasive zebra mussels (*Dreissena polymorpha*) have continued to expand into additional lakes in Kansas over the last two years. Twenty-four lakes (as of October 15, 2015) now have documented populations, totaling 116,462 acres or 61% of reported lake acreage. This is roughly double the infested lake area reported in the 2010 305(b) report, and 3.5 times that reported in the 2008 305(b) report, which was the first 305(b) to document zebra mussels in the state.

Natural sources refer primarily to climate and weather driven impacts (such as water depletion from drought, wind resuspension of sediments, and shallow thermal stratification) or naturally high salinity in some locales. Natural sources account for virtually none of the nutrient and eutrophication or heavy metal related impacts in Kansas lakes.

Table 19. Total lake area impaired by various source categories (in acres)

Source category	Contribution to impairment	
	Major	Moderate/minor
Municipal Point Sources (3)	25,600	120,691
Agriculture (18)	35,237	120,991
Urban (64)	955	7,664
Resource Extraction (252)	0	899
Hydromodification (1)	3,619	7,127
Natural Sources+ (12 and 142)	220	28,649
Resuspension (205)	10,828	255
Introductions of Non-Native Organisms (129)	12,966	103,761

+ Refers mainly to climate and drought impacts plus background levels of salinity and fluoride.

Table 20 lists the numbers and acreage of lakes impacted by nonpoint and/or point sources of pollution, plus those with no identified impairments. Although nonpoint source impairments impact more of the smaller lakes, most of the largest lakes in Kansas have both point and nonpoint sources present within their watersheds.

Table 20. Lakes with identifiable point and nonpoint source pollution contributions

Pollution Type	Number of Lakes	Acres of Lakes
Point Sources +	24	146,291
Nonpoint Sources +	246	176,728
No Identifiable Pollution Sources	66	12,205

+ Numbers include any level of point source contribution, and any magnitude and combination of nonpoint source pollution impacts. Due to the fact that lakes may have both source types within their watersheds, numbers will not sum to match the total number or acres assessed.

Related to the predominant impact that nutrient pollution and the resulting eutrophication process has on lake use support, a recurring activity within KDHE has been to describe what are generally referred to as "reference" trophic state conditions for lakes in Kansas. In essence, reference water quality conditions for lakes occur in watersheds with limited human activity and anthropogenic pollution loads. These "least impacted or better" waterbodies then describe the condition that would be generally attainable if polluting activities were reduced, well buffered, or otherwise mitigated in the general population of lakes and wetlands. Thus, reference condition provides a valuable and attainable water quality goal for a given class of waterbodies.

Based on the water quality and trophic state data collected since the 1970s for lakes in Kansas, the following general conclusions regarding reference trophic state conditions have been reached. Lakes in Kansas with minimal pollution loads can be expected to achieve mesotrophic-to-slightly eutrophic conditions (chlorophyll-a of under 10 to 12 µg/L), with low total nutrient concentrations (total phosphorus below 30 to 35 µg/L) and relatively high water clarity (Secchi depth deeper than 1.25 to 1.50 meters) (Carney 2009, Dodds, Carney and Angelo, Determining ecoregional reference conditions for nutrients, Secchi depth, and chlorophyll-a in Kansas lakes and reservoirs 2006). For this 305(b) cycle, 20.3% of assessed lakes (comprising about 11% of assessed surface area) achieve "least impacted or better" status for nutrient levels and trophic state condition.

Trophic Status

Trophic state classification for Kansas lakes and wetlands is based primarily on the period of record for observed chlorophyll-a (corrected for phaeophytin-a). The rationale is based on the idea that planktonic algal biomass, as estimated by chlorophyll-a, comprises the vast majority of the base of the typical lacustrine food web in Kansas. Although macrophyte communities do contribute to the overall biological production in our lacustrine food webs, it is very rare that they provide a large portion of that food web base in and of themselves. A more typical situation would be a large macrophyte community providing structure so an increased epiphytic and benthic base for a food web could arise. Because of this, and the fact that absence of macrophyte beds is a far more common concern for the water quality and health of Kansas lakes, adjustment of trophic state classification due to macrophyte beds is rare.

The observed level of chlorophyll-a provides a very good estimate of overall lake productivity and production. In addition, higher levels of planktonic algal biomass correlate well with lower levels of aesthetic appeal and recreational opportunity, increased costs for producing drinking water, and increased problems for using lake water for livestock and irrigation (Dodds, Bouska, et al. 2009, Lardner, et al. 2005, Willms, et al. 2002). Because of these factors, the trophic state estimate also becomes valuable for assessing levels of overall support for lakes and wetlands in Kansas.

Whereas higher levels of sedimentation are often concurrent with the eutrophication process in the Midwest, KDHE monitoring does not allow more than a rough indication of sedimentation impacts per se. For the majority of settings, sedimentation is inferred from shoreline and inflow area observations, as well as watershed land use configuration, and the general turbidity of a system. Where high turbidity seems a chronic problem, trophic state may alternately be assigned using total nutrient concentrations and turbidity levels.

Chlorophyll-a values are converted to a trophic state class assignment based on the mean period of record value for a given lake or wetland. The following scale is used in assigning a lake to a given class. The TSI score is that of Carlson (Carlson 1977), based on chlorophyll-a **(Table 21).**

The four primary classes are Oligomesotrophic, Mesotrophic, Eutrophic, and Hypereutrophic. The Eutrophic class is divided into three sub-classes, in order to better describe expected levels of use impairment. Likewise, the hypereutrophic class is divided into two sub-classes for the same reason. In the case of the Hypereutrophic sub-classes, the dominance, or lack thereof, for blue-green algae (cyanophytes) also factors into use support assignments.

In addition, two supplemental trophic state classes are used for lake and wetland assignments; Argillotrophic and Dystrophic. An Argillotrophic waterbody is chronically light limited and nutrient rich, resulting in artificially low algal biomass and chlorophyll-a. A Dystrophic waterbody is highly colored by humic/organic dissolved matter, resulting in potentially lower than expected chlorophyll-a. Dystrophic lakes in Kansas are very rare. **Table 21** presents lake trophic state designations for this reporting cycle.

Table 21. Trophic status of lakes during this reporting cycle

Trophic status	TSI	Number of Lakes		Lake Surface Area	
		Number	Percent of Total	Acres	Percent of Total
Argillotrophic		10	3.11%	33,807	17.75%
Oligomesotrophic	< 40	14	4.35%	407	0.21%
Mesotrophic	40 – 40.99	37	11.49%	12,716	6.68%
Slightly Eutrophic	50 – 54.99	45	13.98%	40,737	21.39%
Fully Eutrophic	55 – 59.99	67	20.81%	72,613	38.13%
Very Eutrophic	60 – 63.99	44	13.66%	24,782	13.01%
Lower Hypereutrophic	63.99 – 69.99	48	14.91%	2,025	1.06%
Upper Hypereutrophic	>69.99	44	13.66%	1,790	0.94%
Dystrophic		0	0.00%	0	0.00%
Unknown		13	4.04%	1,568	0.82%
Totals		322	~100%	190,445	~100%

Trophic State Index (TSI) is based on chlorophyll levels and derived from Carlson (1977)

The greatest portion of individual lakes fell into the slightly-to-fully eutrophic and the hypereutrophic classes, whereas the greatest amount of surface acres were within the slightly-to-fully eutrophic and the argillotrophic classes. This difference primarily results from the skewed size range of Kansas lakes. The vast majority of lakes are smaller (and often shallower) systems, which may be more impacted by pollution sources (on a watershed acre-to-lake acre basis) than larger systems might be. Also, several of the larger Federal lakes in Kansas are located on rivers that tend to move a great deal of eroded sediment. Therefore, several of the largest lakes in Kansas are chronically turbid and assigned to the argillotrophic class.

Whereas roughly 4% of lakes reported for in this cycle lack data for assigning a trophic state class, they comprise <1% of the total reported acres. Some of these lakes are frequently dry systems, making long-term trophic classification problematic.

Trends in Lake Water Quality

Time trends in lake water quality in Kansas are difficult to determine for individual lakes, due to the programmatic emphasis on regional and statewide assessment rather than in-depth studies at specific waterbodies. Trophic state remains the best means to examine trends in overall lake water quality, much as trophic state was earlier identified as a good overall water quality indicator for our lakes. Trends indicated in **Table 22** are very general in nature. If a lake had three or more trophic state assessments over the years, a trend was assigned as follows:

If there was a strong upward direction in trophic state over time, the lake was assigned to the "degrading" category. If there was a strong downward direction in trophic state over time, the lake was assigned to the "improving" category. Lakes were assigned to the "stable" category for two different sets of conditions. First, if trophic state assessments did not change much with time or, second, if they varied to the extent that any obvious trend was masked. Otherwise, lakes were assigned to the "unknown" category if they had no data available, or if they had fewer than three trophic state assessments over the period of record.

A majority of lakes fell into the unknown category, but these only comprise about 5% of the total surface acreage. Of the remaining lakes, most were in the stable category. However, the 41 lakes

with degrading trophic status account for 40% of the total lake acreage. Very few lakes showed an improving trend in trophic status.

Table 22. Trophic state trends in lakes

Category	Number of Lakes		Surface Area of Lakes	
	Count	Percent of Total	Acres	Percent of Total
Improving	7	2.17%	5,351	2.81%
Stable	103	31.99%	97,237	51.06%
Degrading	41	12.73%	77,206	40.54%
Trend Unknown	171	53.11%	10,651	5.59%
Assessed for Trends	*322*	*100%*	*190,445*	*100%*

Control Methods

Control methods for preventing or reversing pollution problems in Kansas lakes, as provided by KDHE, are primarily limited to the provision of technical advice and limited technical support, Section 319 grants aimed at citizen education and watershed BMP implementation, or guidelines for constructing or managing water supply lakes.

KDHE Bureau of Environmental Field Services and Bureau of Water have operated a technical assistance program for taste and odor problems in water supply lakes since 1989. About 200 specific investigations have been undertaken as of 2015, dealing with water supply taste and odor problems, algae bloom concerns, fish kills, and other nuisance and public health concerns. Most such investigations are aimed at providing taxonomic assistance to water suppliers and lake managers. As of 2010, KDHE adopted a policy formalizing the response to algae bloom complaints and investigations in regards to public health. Since 2010, eighty-eight lakes have been investigated for algae bloom related complaints.

In-depth lake sampling and restoration projects at specific lakes in the past were dependent on the Section 314 Clean Lakes Program grants. With those roles now being transferred to Section 319 Nonpoint Source programs, in-depth lake assessment projects and restoration projects have been reduced in scope if not number. In the past, matching effort from the many smaller communities in Kansas was a constant challenge for Clean Lakes Program projects. This problem is, if anything, more pronounced today.

The KDHE BOW does maintain a statewide monitoring program for lakes and wetlands for the purposes of making statewide and regional assessments of overall lake water quality in Kansas. This network operates in order to comply with Federal requirements and expectations under the CWA as well as serve state and local needs for information and technical assistance. This network has been in place since 1975, with wetlands first added in 1988. The network strives to provide a near-census for publicly owned/managed lake surface acreage in the state. The water quality data collected to date has been used to develop numerous water quality models that serve as valuable lake management tools, develop numerous TMDLs, and provide a basis for determining statewide water quality conditions and trends.

The KDWPT provides assistance and technical advice to lake managers and citizens, with the emphasis on fisheries management rather than overall lake water quality. Some practices, such as the use of grass carp (*Ctenopharyngodon idella*) for plant control, or aeration/destratification,

often run counter to maintaining the overall water quality within lakes.

Restoration and Rehabilitation Efforts

Several restoration techniques have been applied in Kansas, but most instances are not documented in a fashion that makes such information readily available. Therefore, only restoration actions specific to projects directly involving KDHE, or higher profile projects primarily involved with other agencies, are discussed within this report.

Some of the most common activities, perhaps dubiously referred to as rehabilitation techniques by many, involve the use of copper sulfate for algae control and grass carp for macrophyte control. Although such activities are sometimes warranted, KDHE has tended to discourage the use of either practice as a prophylactic treatment. Copper sulfate should only be used for algae control if monitoring does show a strong need, and amounts should be applied with the full knowledge that copper will accumulate in the sediments. Grass carp, due to their impact on trophic state and water quality, should not be used for macrophyte control unless aquatic plants produce lake-wide problems to lake users and no other option is feasible.

Fortunately, there are now available at least two aquatic herbicides registered for use in Kansas with selective control capabilities for Eurasian watermilfoil (*Myriophyllum spicatum*) and other dicotyledonous aquatic species. As Eurasian watermilfoil continues to expand into lakes throughout Kansas, the use of these new herbicides (fluridone and triclopyr) may supplant grass carp as the preferred plant control technique. Roughly 15-20% of monitoring network lakes have Eurasian watermilfoil present at varying levels of abundance. As stated elsewhere, the lack of macrophyte beds is a far more common problem for maintaining healthy lakes in Kansas, rather than lakes with excessive macrophyte growth. Therefore, any technique that might allow native macrophyte species to be maintained or encouraged, while dealing with more invasive species, is welcome.

KDWPT is involved in lake restoration and rehabilitation for the primary purpose of fisheries management for recreation. Techniques such as recycling brush and Christmas trees for fish habitat are also common. Water level fluctuations are utilized to manage fish spawning habitat as well as waterfowl habitat. KDWPT annually submits water level adjustment plans for many of the federal lakes in Kansas to the Kansas Water Office (KWO), which are reviewed and commented on at public meetings prior to submission to the USACE.

Aeration has become a common technique applied to smaller Kansas lakes in the attempt to control eutrophication. Unfortunately, almost all these efforts are undertaken without adequate study to determine whether aeration or destratification will positively impact lake water quality. Likewise, follow-up monitoring is typically limited to anecdotally observing a neutral-to-negative impact, followed by abandonment of the technique, or similarly observing a neutral-to-positive impact and continuing the technique into the future, whether or not it has had any measurable impact that could be definitively attributed to the technique. KDHE has strongly recommended to lake managers that aerators only be purchased and applied once a lake study has definitively shown aeration might improve water quality, versus other techniques.

The application of BMPs continues to be the most common and useful means of lake restoration and rehabilitation in Kansas. BMPs can cover a wide range of practices for both agricultural and urban lands. Some of the more common techniques include vegetated buffer strips along streams and shorelines, runoff diversion, pre-treatment impoundments, improved cropping/fertilization practices, sediment retention ponds, and treatment wetlands. Most BMP installation is via the Natural Resource Conservation Service (NRCS) and local Conservation Districts, in cooperation with KDHE and/or KWO.

Wastewater National Pollutant Discharge Elimination System (NPDES) and confined animal feeding operation (CAFO) permits are sometimes used to promote lake water quality restoration. Downstream impacts from such permitted facilities can be taken into account in the permitting process, and during public participation activities for such permits, regarding their limits on specific water quality parameters in effluents.

Dredging has also been an infrequent, and expensive, means to attempt to restore smaller lakes in Kansas. Dredging projects, due to the expense, have been few in number over the years. Such efforts have been even more infrequent since the Section 314 Clean Lakes Program ceased funding Phase 2 project grants through the Section 314 program specifically.

Since the transfer of lake protection and restoration grants to the Section 319 Nonpoint Source Pollution Program, watershed land treatment has become emphasized over in-lake restoration at the state funding level. Any discussion of specific Section 319 projects will be listed in that section of this report.

Acid Effects on Lakes

A total of 173,919 acres of lakes in Kansas were monitored for pH, accounting for 91% of the total reported acres for this report cycle. Water quality impacts in Kansas resulting from pH levels, as seen in the data presented in Table 18**,** are almost totally due to higher pH values attained when lakes are over-enriched with nutrients and suffer from eutrophication and a high trophic state. For this report cycle, only one lake had a pH below 6.5 units.

Even for the Mined Land Lakes Recreation Area units, where past coal mining makes them "likely" sites for low pH problems, such problems are few and far between. Enough time has passed since these areas were actively mined, and many have also been sporadically treated with lime additions, so that low pH problems are almost non-existent. Anecdotal evidence, from conversations with some citizens in southeast Kansas, suggests maybe a number of privately owned strip pit lakes still have chronically low pH, but KDHE has no specific data to confirm this. As most of the private strip pit lakes are as old as the public units, it is anticipated that the majority of them also show moderation of their pH ranges as they have aged.

The lack of an extensive Kansas problem with acidification stems from our regional geology. Kansas is underlain with abundant limestone bedrock and soils derived from that limestone. Therefore, our state has a built in defense against atmospheric deposition of acid materials, or most other sources of acidic conditions. Other than localized spills of acidic material, the only significant sources for such water quality problems in Kansas lie in former coal mining areas or

shale quarries. As shown by the pH data KDHE has collected throughout this region of southeast Kansas, such problems are mild and infrequent today.

Wetlands Assessment

Extent of Wetland Resources

The wetland area reported for this 305(b) cycle is 55,969 acres. This includes state and federal public wetland areas in Kansas, plus several that are owned or managed at the local level. This total does not include privately owned wetland areas, which likely comprise a larger total surface area in the state.

At present, Kansas does not have the data for a precise estimate of wetland loss from historic levels or for the current wetland area extant in the state. Several studies have been conducted in the past, but many have assumptions based on their primary study purpose that render them less useful for providing numbers related to total wetlands. One of the better studies (Dahl 1990) suggested that by the 1980s the conterminous United States had lost roughly 53% of its wetlands whereas Kansas had lost 48%. This suggests that our wetland loss is similar to the general estimates for the United States at about 2% per year.

The Dahl (1990) study suggested that historical wetland area in Kansas was around 841,000 acres total. A study by the United States Fish and Wildlife Servic (USFWS) (WRAP, 1992) also suggested that total wetland area in Kansas, as of the 1980s, totaled around 435,400 acres, which is fairly consistent with estimated losses from historic levels from the Dahl study. Applying the 2% per year general loss rate to the USFWS value, perhaps 215,000 to 265,000 acres of wetlands still exist in Kansas. If accurate, the majority of extant wetlands in Kansas are on private lands.

No estimates are available that differentiate the wetlands in Kansas among various wetland types, however, field observations suggest the majority of Kansas wetlands are palustrine freshwater marshes, palustrine saltwater (oligohaline) marshes, riparian wetlands, playas, and wet meadows.

Integrity of Wetland Resources

Of the 55,969 wetland acres (36 wetlands) assessed during this reporting cycle, 40,493 acres (6 wetlands) are considered to be monitored sites. This represents 72% of the reported acreage. An additional 13 wetlands comprising 1,751 acres are reported as evaluated. A total of 13,725 acres (17 wetlands) were assigned to the unknown category due to insufficient data. In most cases, “insufficient water quality data” resulted from the intermittent nature of standing water in wetlands (regarding both availability and depth) from which representative water samples might be collected. Many of these areas above major federal lakes are filled seasonally for fall and winter recreation, and frequently are dry during the summer sampling period.

Wetlands in Kansas have had Use Attainability Analyses completed for the range of designated uses, but the primary functions of wetlands in Kansas are as aquatic life support and recreational sites. Therefore, only those specific individual uses are reported in **Table 23.**

Table 23. Individual use summary for wetlands (in acres)

Goals	Use	Size Assessed	Fully Supporting	Full Support But Threatened	Partially Supporting	Non Supporting	Insufficient Data
Protect and Enhance Ecosystems	Aquatic Life (acute criteria)	55,969	104	0	1,391	40,749	13,725
Protect and Enhance Public Health +	Fish Consumption ++	55,969	26,071	0	2,240	13,933	13,725
	Secondary Contact	55,969	104	0	1,391	40,749	13,725

+ = Shellfishing use category not applicable and thus not reported
++ = Based on food procurement criteria for water

Table 24 presents data on the causes of use impairment in wetlands. The primary causes of wetland use impairment for this 305(b) cycle are over-enrichment and extreme trophic state conditions and elevated pH levels due to these extreme conditions. Arsenic was detected in a sample from one of the state's largest wetlands, and could be the result of the wetland recently re-filling and exiting a severe drought period.

Table 24. Total wetland acres impacted by various cause categories (in acres)

Cause Category (and code)	Contribution to impairment	
	Major	Moderate/Minor
Pesticides - atrazine (148)	0	3,295
Heavy Metals – arsenic (145)	13,933	2,240
Heavy Metals – lead (663)	0	1,055
Heavy Metals – selenium (984)	0	1,265
Nutrients and Eutrophication (483 and 746)	23,649	18,493
Chloride (272)	0	35,933
Sulfate (1016)	0	28,398
High pH (620)	13,200	3,505
Flow Alterations (546)	0	13,933

Table 25. Total wetland acres impacted by various source categories

Source Category	Contribution to impairment	
	Major	Moderate/Minor
Municipal Point Sources (3)	4,572	13,934
Agriculture (18)	1,555	44,141
Urban (64)	70	20
Resource Extraction (252)	0	220
Hydromodification (1)	0	36,009
Natural Sources+ (12 and 142)	0	14,934
Resuspension (205)	0	1,055
Municipal Point Sources (3)	4,572	13,934

+ Refers mainly to climate and drought impacts plus background levels of salinity

Table 25 presents data on the sources of use impairment in Kansas wetlands. The major sources of wetland use impairment are agricultural runoff, hydrologic modifications, and natural

processes. Natural sources refer primarily to climate and weather driven impacts (such as water depletion from drought) and naturally high salinity in some locales. Natural sources account for virtually none of the nutrient/eutrophication or heavy metal related impacts in Kansas wetlands. During this reporting cycle, 41,775 acres of wetlands were assessed as hypereutrophic. This represents 75% of the total acreage and nearly 99% of the acreage with available data. In many cases, the degree of hypereutrophy was extreme. Certainly, the level of nutrient enrichment was far above the expectations for wetland water quality in relatively low-impact drainages (*i.e.*, "least-impacted" or better) (KDHE, 2002). These numbers indicate that the vast majority of the remaining Kansas wetlands under public control and management suffer an inordinately high degree of impact from nutrient enrichment and eutrophication.

This current situation has led to the erroneous general impression that wetlands in Kansas are, as a matter of course, possessed of poorer water quality and extreme trophic state conditions. Whereas wetlands would be expected, on average, to have higher nutrients and trophic status than comparable lakes, least impacted condition for wetlands is only marginally higher than least impacted condition for lakes. **Table 27** and **Table 27** present data on wetland trophic status and gross trophic state trends for this 305(b) cycle, respectively.

Table 26. Trophic status in wetlands

Trophic status	Number of wetlands		Acreage of wetlands	
	Count	Percent of total	Acres	Percent of total
Argillotrophic	0	0.00%	0	0.00%
Oligomesotrophic	2	5.56%	40	0.07%
Mesotrophic	1	2.78%	1	<0.01%
Slightly Eutrophic	0	0.00%	0	0.00%
Eutrophic	3	8.33%	63	0.11%
Very Eutrophic	2	5.56%	365	0.65%
Lower Hypereutrophic	2	5.56%	1,026	1.83%
Upper Hypereutrophic	9	25.00%	40,749	72.81%
Dystrophic	0	0.00%	0	0.00%
Unknown	17	47.22%	13,725	24.52%
Totals	36	~100%	55,969	~100

Table 27. Trophic state trends in wetlands

Category	Number of wetlands		Acreage of wetlands	
	Count	Percent of total	Count	Percent of total
Improving	0	0.00%	0	0.00%
Stable	14	38.89%	40,633	72.60%
Degrading	3	8.33%	1,311	2.34%
Trend Unknown	19	52.78%	14,025	25.06%
Assessed for Trends	36	~100%	55,969	~100%

Development of Wetland Water Quality Standards

Wetlands are currently classified as "waters of the state" within the Kansas surface water quality standards (KDHE 2012). Use Attainability Analyses (UAAs) have been completed for all designated uses, and the results of these are incorporated into the Kansas Surface Water Register. Wetlands receive equal treatment and protection with lakes, regarding application of state water

quality standards for narrative and numeric criteria, antidegradation provisions, and implementation procedures. The USEPA has proposed wetland specific biocriteria, but the development of such biocriteria is not considered feasible at this point in time.

Additional Wetland Protection Activities

Wetland protection tends to be distributed among agencies in Kansas, with no agency having a primary function for all aspects of wetland management. KDHE, KDWPT , Kansas Department of Agriculture, and Kansas Water Office, as well as the federal USACE are all involved in wetland protection and regulation. Kansas statutes (K.S.A. 82a-325 *et seq.*) require a total of eight state agencies, including KDHE, to review proposed water development projects for "beneficial and adverse environmental effects."

Persons desiring to alter regulatory wetlands in Kansas must file for Section 404 "dredge and fill" permits with the USACE. Simultaneously, such permit requests come to KDHE for a Section 401 water quality certification. The department makes a determination of the projected impact on water quality resulting from the proposed action and may approve the action, approve it with modifications, or deny the action based on these projected water quality impacts.

Based on the water quality and trophic state data collected since the 1970s for lakes and wetlands in Kansas, the following general conclusions regarding reference conditions have been reached. Lakes in Kansas with minimal pollution loads can be expected to achieve mesotrophic-to-slightly eutrophic conditions, with low total nutrient concentrations and relatively high water clarity (Dodds, et al., 2006; Carney, 2009). Wetlands with similar minimal pollutant loads could be expected to achieve a trophic state in the low-to-mid range of eutrophic (chlorophyll-a at or under 12-to-18 µg/L), with moderate total nutrient levels (total phosphorus at or under 50-to-80 µg/L) (KDHE 2002) For this 305(b) cycle, six wetlands achieved "least impacted or better" status for nutrient levels and trophic state condition, however all were small and totaled less than 1% of the wetland acres assessed. As stated earlier in this report section, over 90% of wetland acres exceed this least impacted or better threshold by a sizeable margin, suggesting public wetlands in Kansas are at high risk from nutrient pollution and eutrophication.

II. 303(D) ASSESSMENT RESULTS

The Kansas 2016 303(d) list identifies 500 station/pollutant combinations of water quality impairment on lakes, wetlands and stream systems (watersheds), encompassing 2521 stream segments, and needing TMDLs to address the offending pollutants.

The 2016 list identifies 467 station/pollutant combinations of waters that were previously listed as impaired but are now meeting water quality standards, with 11 of these being new in 2016.

The complete list is included in the printed version of the integrated report submitted to USEPA (**Appendix B**). This list also can be accessed by the public via the internet at http://www.kdheks.gov/tmdl/methodology.htm.

Public Health Issues

I. DRINKING WATER USE

Use of surface waters in Kansas for drinking water supply (both public and domestic) is first determined through Use Attainability Analyses (UAAs). The domestic water supply use can be either existing or attainable; therefore, the UAA process examines the likely hydrology and ambient water quality to determine attainability. Existing drinking water supply use can be verified by inspection of water rights from the Division of Water Resources of the Kansas Department of Agriculture. Attainable use is assigned to perennial streams that exhibit parameter concentrations (chloride, sulfate, fluoride, total dissolved solids) that are less than twice applicable criteria or guidance. As a result of this screening, most streams in the central and eastern portions of Kansas could potentially support drinking water uses. Similarly, lakes are assessed and, more often than not, found to support attainable drinking water supply uses.

Currently, 21,705 stream miles (72% of the Kansas Surface Water Register) and 188,924 acres of lakes bear the designated use for Domestic Water Supply. Of the lake acreage, 149,839 acres currently serve as existing and emergency public water supply, but no such calculation can be made easily for stream mileage. Moreover, assessment of support for this use is complicated by the provisions of the Kansas Surface Water Quality Standards. Application of water quality criteria protective of drinking water is to occur at "the point of domestic water supply diversion." Therefore, true assessment is focused on support of existing uses. Furthermore, domestic water supply use is defined as the production of potable water after appropriate treatment. The ambient water quality should not confound the routine treatment of the raw water supply into potable water for human consumption. However, assessment of drinking water use support under 303(d) is chiefly directed at the potential, attainable use of that water at some unspecified future time.

Assessing support of the water quality criteria underlying the drinking water use involves evaluating monitoring data for too-frequent excursions from applicable numeric criteria, such as nitrate, sulfate, chloride, arsenic or fluoride. In cases of elevated nitrate, the root cause has typically been wastewater with insufficient denitrification. Such situations call for the water to be classed Category 5 with a TMDL scheduled for development.

Impairments due to chloride, sulfate, arsenic and fluoride are often contributed by natural, geologic sources, sometimes exacerbated by water use and reuse, concentrating salts through water loss induced by evapotranspiration. To the degree possible, background concentrations are established as part of the water quality standards that reflect natural contributions that exceed the existing criteria for those pollutants, are not influenced by flow alterations or diversions, and leave the surface water usable under the definition of domestic water supply use.

Impairment from excessive nutrients is assessed relative to trophic conditions in lakes that present problems to aquatic life, recreation, and drinking water. Endpoints used by eutrophication TMDLs are set at level that should assure full attainment of all three of these designated uses. Similarly, screening for excess phosphorus in streams result in adaptive TMDLs that continue to reduce loadings of phosphorus from point and non-point sources until such time that blue-green algae counts and complaints of taste and odor in drinking water are minimized.

II. BEACH USE (BLUE-GREEN ALGAE AND ALGAL TOXINS)

Eutrophication, the enrichment of waterbodies with excess nutrients and the nuisance algal growth that results, causes many impacts to water quality and to the beneficial uses we expect our lakes and streams to provide us. Impacts can range from disrupting ecological system integrity, to reducing revenues from recreational use, to increasing costs and risks related to providing drinking water (Dodds, Bouska, et al. 2009). Perhaps the most noticeable impact to the general public is the generation of large population explosions of phytoplankton that are generally called "blooms." These algae blooms are the net result of over-enrichment of lakes with plant nutrients (primarily phosphorus, but also nitrogen). Blooms can occur suddenly, and at all times of the year, and can be composed of numerous species from various taxonomic groups. However, the most common blooms, and certainly of the most concern to public health, are blooms composed of blue-green algae (cyanophytes).

Blue-green algae are actually large, free-living, photosynthetic bacteria. They are a natural part of the ecology, usually occurring in fairly small numbers, only becoming a problem when they grow to extreme populations. They are lumped under the functional term "algae" with other organisms because they share many of the same habitat requirements as these other types of algae (green algae, diatoms, euglenoids, dinoflagellates, *etc.*). A blue-green algae bloom can be extremely large, numbering in the millions of cells per milliliter of water. Such blooms create conditions that are visually objectionable to the public, produce foul odors, obstruct boats and other forms of recreation, cause taste and odor problems in finished drinking water, and cause fishkills. Most blue-green algae blooms will occur in nutrient enriched lakes during the summer, when water temperatures are highest, but a few species prefer cooler temperatures. Although they produce sufficient aesthetic problems to impair many recreational and economic activities, their ability to produce toxic compounds makes them a threat to public health as well.

Blue-green algae are capable of producing a number of different biochemical compounds that are toxic to warm blooded organisms (for the most part). These compounds fall into three general categories: hepatotoxins (which primarily affect the liver and other internal organs), neurotoxins (which primarily impact the nervous system), and dermatotoxins (which affect the skin, mucus membranes, eyes, ears, and throat). Over 200 different algal toxins have been identified in freshwaters (where blue-green algae are the most common toxic species) and in marine environments (where dinoflagellates tend to be the most common type of toxic algae). In the Midwest, microcystins (a type of hepatotoxin) are the most commonly documented algal toxin type (Graham, et al. 2010), although other toxins (such as the neurotoxic anatoxin-a and saxitoxin) do occur at a lesser frequency. There are almost 100 identified variants of the microcystin toxin known. Some of these algal toxins rival, or exceed, the potency of cobra venom.

Over two dozen genera of blue-green algae may be found in the waters of Kansas, but the majority of blooms and complaints are attributable to five genera. All are colonial forms, forming filaments or large globs of cells that look like green cottage cheese floating in the water. These include *Microcystis* spp. (species can produce the hepatotoxin microcystin), *Anabaena* spp. (species can produce both hepatotoxins and neurotoxins), *Aphanizomenon spp.* (species can produce neurotoxins), *Planktothrix* spp. (species can produce both neurotoxins and the

hepatotoxin microcystin), and *Cylindrospermopsis raciborskii* (can produce the hepatotoxin cylindrospermopsin). Essentially all species of blue-green algae produce dermatotoxins that are associated with their cell walls. Most blue-green algae have optimal growth at higher ambient temperatures (>27^{o} C), but some species, such as *Planktothrix rubescens* seem to grow quite well in the middle of winter, often forming reddish masses of algae under ice layers.

Around the world, pets, livestock, wildlife, and people have become ill or died after exposure to blue-green blooms and their toxins, including Kansas. Exposure to algal toxins is primarily through the ingestion of water containing blue-green algae, but exposure can also occur through breathing aerosols or through skin contact. Because of the increase in lakes and streams suffering from nutrient enrichment and eutrophication, problems related to blue-green algae and their blooms have also increased dramatically over the last few decades. Many U.S. states, and a number of foreign countries, have adopted formal programs and protocols for dealing with the public health threat posed by excessive blue-green algae in our waters. Kansas joined those other entities several years ago by adopting a formal response policy on August 13, 2010.

The program adopted by KDHE is a joint effort among several Bureaus within both Divisions (Health and Environment) of the agency. It is complaint driven, with citizens, lake managers, or other officials able to access and fill out a form online (www.kdheks.gov/algae-illness/index.htm). Once submitted, the complaint is vetted, and appropriate sampling of the waterbody is conducted. Sampling is directed towards the major points of public access onto the water (marinas, swimming beaches, main boat ramps or dock facilities, *etc.*), and continues until algal cell counts and toxin levels decline to safe thresholds. The program is limited to publicly owned or managed waterbodies. To date, 88 lakes have been sampled under this program. The program informs the public of health risks associated with the current condition of the lake, advises lake managers as to what course of action is most appropriate, and supplies technical expertise to those lake managers. Three levels of threat are recognized under the program: "Public Health Watch" (80,000 to <250,000 blue-green cells/ml or microcystin concentrations of ≥4 to <20 µg/l), where the existing conditions could quickly become a threat to health and safety; "Public Health Warning" (≥250,000 to ≤10,000,000 blue-green cells/ml or microcystin concentrations ≥20 µg/l to 2,000 µg/l), where conditions are believed to represent a threat to health and safety; and "Recommended Lake Closure" (>10,000,000 blue-green cells/ml or microcystin concentrations of >2,000 µg/l), where it is recommended that all in-lake recreation cease and that picnic, camping, and other public land activities adjacent to affected waters be closed (Chorus and Bartram 1999).

III. FISH CONSUMPTION

Public health concerns related to the consumption of locally caught fish are addressed in the 2015 fish advisories. These advisories are available on the KDHE website at http://www.kdheks.gov/news/web_archives/2015/01062015.htm, and are also printed in the 2015 Fishing Atlas (Kansas Department of Wildlife, Parks, and Tourism 2015)

For many years, KDHE has designated waterbody-specific advisories and warnings. However, in 2013, for the first time, KDHE also issued a statewide advisory due to the presence of mercury in fish tissue. Restrictions are based on consumer type (sensitive population *vs.* general public) as

well as fish species. Harmful algae blooms are also mentioned in the advisory as they relate to fish consumption.

IV. OTHER CONSIDERATIONS

In addition to routine and proactive surface water monitoring, KDHE also provides immediate response to events that may affect or reflect surface and groundwater quality. One of these is the Spills Program, administered by the Bureau of Environmental Remediation (and operated in conjunction with the Kansas Corporation Commission (KCC), for spills on oil leases). The Spills Program is authorized by Kansas law (KSA 65-171d and KAR 28-48) and is used to address events that can be quickly resolved with the goal of preventing long term harm to our soil or water resources. If a spill or release impacts groundwater, it may be referred to a remedial program to address the problem, but sometimes the spiller is successful in isolating groundwater impacts and can remediate it immediately through the Spills Program.

Table 28 presents a brief summary of events investigated and resolved by the Spills Program in 2014-2015. This count does not include spills that occurred in contained, non-flowing waterways (such as dry road ditches or dry storm sewers) and were cleaned up before flowing water or stormwater was introduced into the system. Also, it does not include events overseen or investigated by KCC, which would include any spill related to petroleum extraction (hydrocarbons, drilling fluids, brine, etc).

Table 28. Summary of 2014-2015 spill events

Category	2014	2015
KDHE purview: surface water impacted	67	46
with fishkill events	*(0)*	*(0)*
KDHE purview: Groundwater impacted	2	2
with referral to long-term remediation	*(2)*	*(2)*

Another rapid-response program is the Fishkill Response program, administered through the Bureau of Environmental Field Services and coordinated with colleagues from KDWPT. In 2014-2015, KDHE responded to 19 fishkill events. These were investigated and resolved, and a brief summary is presented in **Table 29.** None of the fishkills were associated with Hazmat spills noted in **Table 28,** but four fishkills were associated with accidental discharge events that were reported and cleaned up through different reporting channels.

Table 29. Summary of fishkill events investigated by KDHE 2014-2015

Waterbody Type	Cause	Year		Grand Total
		2014	2015	
Lake or Pond	Natural kill, winter kill, summer kill, algal toxins, algal oxygen depletion	3	3	6
	Temperature extremes	1	0	1
	Toxics, chlorine, surfactants, organic compounds	1	0	1
	Unknown	3	0	3
	TOTAL	**8**	**3**	**11**
Spillway	Flow related event	0	1	1
	TOTAL	**0**	**1**	**1**
River, Stream, or Creek	Natural	2	1	3
	Toxics, chlorine, surfactants, organic compounds	3	0	3
	Unknown	0	1	1
	TOTAL	**5**	**2**	**7**
GRAND TOTALS		**13**	**6**	**19**

PART D. GROUNDWATER MONITORING AND ASSESSMENT

Overview

Kansas no longer maintains a statewide groundwater quality monitoring program, and funding for its renewal appears unlikely in the near future. However, an earlier monitoring program (suspended in 2002 owing to budgetary constraints) routinely evaluated groundwater quality at more than 200 sites. Individual wells in the monitoring network were sampled on a two-year rotational basis, with approximately half the wells being sampled in any given year. All wells in the network adhered to specific siting, depth, and construction criteria, and the network as a whole was deemed representative of the state's major aquifer systems. The program's surviving electronic database contains roughly 150,000 records spanning 120 different physical, chemical, and radiological parameters and 327 groundwater quality monitoring locations. Additional background information is presented in the program's Quality Assurance Project Plan and accompanying set of Standard Operating Procedures, last revised in 2000 **(KDHE 2000)**,

Groundwater Monitoring by Other Agencies

The Kansas Geological Survey, with funding from the Kansas Water Office, maintains the state's Master Ground-Water Well Inventory, which links together its own databases with those from KDHE and Kansas Department of Agriculture's Division of Water Resources (http://www.kgs.ku.edu/HighPlains/data/). Most of the information in these databases relates to well logs and water levels, rather than water quality.

In addition to some monitoring done by KDHE, other agencies and entities perform groundwater quality monitoring, typically as part of focused projects on specific issues. Groundwater Management Districts, the Kansas Geological Survey, and the U.S. Geological Survey (USGS) test groundwater for various management and research purposes and have done so for many years. One example is a series of cooperative projects done by Kansas Geological Survey, US Bureau of Reclamation, Groundwater Management District 2, and the Kansas Water Office to look at salt intrusion into the Equus Beds of the High Plains Aquifer; information is available at http://www.kgs.ku.edu/Hydro/Equus/index.html, and some results are available as Kansas Geological Survey reports (Young, et al. 2001).

The High Plains Aquifer is the primary water source for the western half of the state; the Equus Beds represents an area of relatively higher potential recharge, where interaction with surface water and alluvial aquifers occurs. The USGS continues to monitor activities related to the Equus Beds and is conducting some additional groundwater monitoring (Teresa Rasmussen, USGS, pers. comm. January 2015); a summary follows.

The USGS collected groundwater samples during 2011-15 as part of the *Equus* Beds groundwater project. The purpose of the *Equus* project is to define water quantity and quality conditions related to artificial recharge of the *Equus* Beds aquifer, to describe the chemical and hydrologic processes affecting the aquifer, and to evaluate the effects of aquifer storage and recovery on water quantity and quality. Since 1995, more than 10,000 surface water and

groundwater water-quality samples have been collected and analyzed for more than 400 compounds, including most of the compounds on the USEPA's primary drinking-water standards maximum contaminant level list and secondary drinking-water regulations secondary maximum contaminant level list. Samples were analyzed for major ions, trace elements, nutrients, bacteria, pesticides, volatile organic compounds, dissolved radionuclides, coliphage, arsenic species, and glyphosate. Water-quality constituents of concern for the *Equus* project include specific conductance, oxidation-reduction potential, chloride, sulfate, manganese, nitrate, iron, arsenic, and total coliform bacteria. An overview of the project, with links to reports and data tables, is available at http://ks.water.usgs.gov/equus-water-quality, and published reports are also available (Tappa, et al. 2015).

As part of the National Water Quality Assessment Program (NAWQA) groundwater program, the USGS also collected groundwater samples from 29 wells in northeast Kansas in 2011, one well in northeast Kansas in 2013, and ten wells in western and central Kansas in 2015. Samples were analyzed for trace elements, nutrients, organics, microbiological indicators, emerging contaminants, and age tracers. Data from the sites will be used as part of NAWQA's principal aquifer studies to assess trends in groundwater quality and suitability as a source of drinking water. Data can be downloaded from http://waterdata.usgs.gov/nwis. As of February 2016, the USGS National Water Information System mapper (http://maps.waterdata.usgs.gov/mapper/index.html) shows over 200 "active" groundwater monitoring sites in Kansas.

Groundwater Monitoring by KDHE

Some groundwater quality information continues to be gathered by KDHE through the efforts of its major regulatory bureaus; see **Table 30** for an overview of state groundwater protection and monitoring programs. The Bureau of Environmental Remediation routinely samples groundwater from the vicinity of groundwater remedial sites, storage tank cleanup sites, and a few active surface mining operations. The Bureau of Waste Management obtains groundwater quality information from over 175 landfills (both closed and active) as well as hazardous waste sites across the state. BOW requires a number of major NPDES permit holders to periodically submit data on groundwater quality. Examples include large CAFOs, meat processing facilities, electrical power plants, and a few municipal WWTFs. Underground Hydrocarbon Storage well and brine storage pond permits as well as Underground Injection Control Class III salt solution mining well regulations also require submittal of data on groundwater quality. The Underground Storage Well and brine storage pond regulations and the Underground Injection Control regulations require monitoring the shallow groundwater for brine and product releases to help ensure operations are conducted in a protective manner.

Monitoring activities generally focus on surficial groundwater and/or a very limited set of analytical parameters; see

Table 31 for a summary of major sources of groundwater contamination in Kansas. The most important and ubiquitous contaminant found in groundwater is nitrate, because it affects usability of water as a drinking water source. Nitrates are primarily from anthropogenic sources: fertilizer storage and application as well as human and livestock waste. Agricultural and industrial chemicals and refined hydrocarbons found in groundwater (such as atrazine, carbon tetrachloride, and gasoline) are also of human origin. However, other groundwater contamination is the result of leaching or concentration of naturally occurring soil chemicals (such as chloride, fluoride, arsenic, selenium, and radionuclides); human activities may facilitate the leaching or concentration of substances, but the contamination is indirect.

A statewide cumulative summary of groundwater contamination is provided in **Table 32**. These assorted monitoring operations are not intended to provide representative information on the state's major aquifer systems or to serve as a coordinated and comprehensive ambient groundwater quality monitoring program, but rather a tracking system for known contamination issues. For Underground Injection and Hydrocarbon and brine wells, a site is considered "resolved" once all appropriate cleanup actions are underway, even if the process may require a number of years for complete cleanup. Groundwater monitoring at CAFOs is used to detect if the waste management system is protecting groundwater from nutrient releases rather than an implied discharge. Some swine facilities are required by Kansas Statutes to install groundwater monitoring based upon number of animal units confined and the depth to groundwater. The secretary may require installation and sampling of groundwater monitoring wells in the vicinity of any waste retention lagoon or pond when the Secretary determines necessary.

Groundwater monitoring related to PWSSs is addressed separately in the next section, because of its direct impact on human health. Under the Safe Drinking Water Act, public water suppliers are required to submit data on source water quality. In Kansas, a majority of sources are groundwater.

Table 30. Summary of state groundwater protection programs

Programs or Activities	Check (X)	Implementation Status	Responsible Agency / Bureau
Monitoring, mapping, and characterization			
Ambient groundwater quality monitoring		(Suspended in 2002)	(KDHE)
Aquifer mapping	X	Established	KGS
Aquifer characterization	X	Ongoing	KGS
Aquifer vulnerability assessment	X	Ongoing	KDHE-BOW
Comprehensive data management	X	Ongoing	KGS, KDHE-BOW, -BER, -BWM
Protection and planning			
Interagency coordination for groundwater protection initiatives	X	Ongoing	KWO
Best Management Practices (nonpoint)	X	Established	KDHE, KWO
Groundwater classification – for CAFO design	X	Established	KDHE-BOW
Pollution Prevention Program (for small businesses)	X	Established	KDHE-BER
Source Water Assessment Program (SWAP)	X	Established	KDHE-BOW
Drinking Water Protection Program (DWPP)	X	Ongoing	KDHE-BOW
Vulnerability assessment for drinking water	X	Ongoing	KDHE-BOW
State septic system regulations	X	Established	KDHE-BOW
Underground Storage Tank (UST) installation requirements (designed to prevent release of petroleum and hazardous materials)	X	Established	KDHE-BER
Permitting			
Industrial and Municipal discharge permits	X	Established	KDHE-BOW
CAFO-specific Groundwater protection regulations	X	Established	KDHE-BOW
Livestock Waste Management Program to prevent surface water and groundwater pollution	X	Established	KDHE-BOW
Water quality standards for groundwater recharge use	X	Established	KDHE-BOW
Pesticide State Management Plan	X	Established	KDA
Underground Storage Tank (UST) Permit Program (permits issued to ensure compliance with operating regulations)	X	Established	KDHE-BOW
Underground Hydrocarbon Storage Well Program (for pressurized HCs in salt caverns and associated brine storage ponds)	X	Established	KDHE-BOW
Underground Injection Control Program (for Class I deep disposal injection wells, Class III salt solution mining wells, and Class V shallow injection wells)	X	Established	KDHE-BOW
Underground Injection Control Program (for Class II injection wells)	X	Established	KCC
Well installation regulations for water wells, Class I, III, and V injection wells, and underground HC storage wells)	X	Established	KDHE-BOW
Well installation regulations (for Class II injection wells)	X	Established	KCC
Remediation			
Active Superfund Amendments and Reauthorization Act (SARA) Title III program	X	Established	KDHE - BER
Resource Conservation and Recovery Act (RCRA) Primacy	X	Established	KDHE – BWM
State Cooperative Program (State-led equivalent to Federal Superfund)	X	Established	KDHE-BER

Programs or Activities	Check (X)	Implementation Status	Responsible Agency / Bureau
State Water Plan Orphan Sites (Response to contamination where no viable responsible party has been identified)	X	Established	KDHE - BER
UST Remediation Fund (provides financial assurance for cost of remediating releases of petroleum)	X	Established	KDHE - BER
Well abandonment regulations (for both water and mineral wells)	X	Established	KDHE & KCC

KGS = Kansas Geological Survey
KDA =Kansas Department of Agriculture
KCC = Kansas Corporation Commission
KWO = Kansas Water Office
KDHE-BOW = Kansas Department of Health and Environment Bureau of Water
KDHE-BER = KDHE Bureau of Environmental Remediation
KDHE-BWM = KDHE Bureau of Waste Management

Table 31. Major sources of groundwater contamination for Kansas

Highest Priority Contaminant Sources	Factors Considered in Selecting a Contaminant Source	Types of Contaminants
Agricultural Activities:		
Chemical and grain facilities	A, C, D	2, 3, 4, 5
Animal feedlots	A, C, D, E	5, 7, 10
Irrigation practices	A, C, E, F, H	6, 7, 8, 9
Land application of pesticides, fertilizer and manure	A, C, E	1, 2, 5,10,12
Storage and Treatment Activities:		
Land application (regulated/permitted)	A, C, D, E	5, 7, 10
Storage tanks (AST/LUST)	A, B,C, D	4
Surface impoundments	A, E	5, 8
Disposal Activities:		
Landfills and illegal dumping	A, C,E	3, 4, 7, 8
Deep injection wells	A, G	4, 7, 8, 13
Other Activities:		
Active/abandoned industrial facilities (including dry cleaning)	A, B, C	2, 3, 4, 5, 7, 8, 9, 13
Oil and gas activities (including extraction and refineries)	A, B, C, D	4, 7, 8, 9
Pipelines and sewer lines	A, E	3, 4, 5
Salt water intrusion	B, C, D, E	7
Spills, trucking, rail	A, D	2, 3, 4, 5, 7, 8

Factors Considered in Selecting a Contaminant Source:
(A) Human health and/or environmental risk (toxicity)
(B) Size of population at risk
(C) Location of sources relative to drinking water sources
(D) Number and/or size of contaminant sources
(E) Hydrogeologic sensitivity
(F) State findings, other findings
(G) Documented from mandatory reporting
(H) Geographic distribution/occurrence
(I) Other criteria as described in narrative

Types of Contaminants:
(1) Inorganic pesticides
(2) Organic pesticides
(3) Halogenated solvents
(4) Petroleum compounds
(5) Nitrate
(6) Fluoride
(7) Salinity/brine
(8) Metals
(9) Radionuclides
(10) Bacteria
(11) Protozoa
(12) Viruses
(13) PCBs
(14) Other contaminants as described in narrative

Table 32. Groundwater contamination: statewide cumulative summary through December 31, 2015

Source Type	# of KS Sites	# of Sites with Confirmed Releases	# with Confirmed Groundwater Contamination	Primary Contaminants	# of Site Assessments	# of Sites with Source Removed	# of Sites with Corrective Action Plans	# of Sites with Active Remediation	# of Sites with Ongoing Monitoring	# of Sites with Cleanup Resolved
NPL **	12	12	11	VOCs, metals	12	Unavail	4	7	7	0
CERCLIS (non-NPL)**	95	95	17	VOCs, metals , PCBs	95	Unavail	2	2	2	62
DOD/FUDS**	427	427	110	VOCs, metals, refined petroleum	427	Unavail.	1	9	11	85
LUST (Leaking Underground Storage Tanks)	10,884	5205	4413	gasoline and diesel fuels	10,884	Unavail	N/A	182	928	9590
State Sites (not including LUST sites or KCC jurisdiction sites)	2,179	2,179	1038	VOCs, metals, refined petroleum	2,179	Unavail	54	201	201	890
Concentrated Animal Feeding Operations	6,298	N/A	N/A	Nitrate and chlorides	6,298	Unavail	N/A	N/A	75	N/A
RCRA Corrective Action (incl. 6 military sites)	45	45	45	VOCs, metals, semi-volatiles	44	10	22	21	35	11
Solid Waste Landfills-Active +	70	40	40	VOCs & metals	68	N/A	1	1	70	0
Solid Waste Landfills – Closed +	130	94	94	VOCs & metals	109	N/A	4	4	100	0
Underground Injection Wells ++	32	4	3	Brine	4	4	2	2	4	4
Underground Hydrocarbon Storage Wells	10	1	0	Brine	1	1	1	1	1	1
Underground Hydrocarbon Storage Brine-Storage Ponds (Multiple ponds per site)	9	9	9	Brine	9	9	9	9	9	9

+ KDHE Bureau of Waste Management requires groundwater monitor at all active landfills and for a minimum 30 years at all closed landfills,

++ Represents Class I and III injection wells, but does not include Class II brine injection wells.

N/A - not applicable; CERCLIS - Comprehensive Environmental Response, Compensation, and Liability Information System; Includes non-NPL Management Assistance (CERCLA Lead and Superfund sites); DOD/FUDS - Department of Defense/Formerly Used Defense Sites; LUST - Leaking Underground Storage Tanks; NPL - National Priority List; NPS - Nonpoint Source; RCRA - Resource Conservation and Recovery Act; VOC – volatile organic compounds

Groundwater Monitoring associated with Public Water Supply Systems

A Public Water Supply System (PWSS) entity may be composed of multiple facilities or components: groundwater wells, surface intakes, consecutive connections, treatment plants, storage tanks, and distribution systems. Normally, water flows from a raw source (or consecutive connection, if purchased from another entity) into a treatment plant, and then into the distribution system. Treated water can also be purchased through a consecutive connection from another PWSS which would flow directly into the distribution system with no further treatment. Public water supply compliance monitoring is usually performed at the end of the treatment plant processes just prior to entry into the distribution system, or in the distribution system itself. Treated water samples do not necessarily reflect the unaltered state of the raw water that initially flows into the treatment plant.

Only a few compliance samples are collected at the raw water source, *i.e.*, groundwater wells and surface intakes. However, some raw water monitoring is performed under the aegis of Public Water Supply, and the results are reported here. Raw water sampling (whether from a groundwater or surface water source) is normally limited to just a few types of sampling:

1. (Compliance Monitoring) Total organic carbon samples are collected from intakes to be used as part of the Disinfection By-Product rule determinations. The samples are matched up with a corresponding treatment plant sample so compliance can be determined.
2. (Compliance Monitoring) Groundwater samples are collected as part of the Groundwater Rule, which requires source monitoring after a positive microbiological sample is collected in the distribution system. The goal is to determine whether a positive in the distribution system can be traced back to raw source water. In Kansas, since the inception of the GWR, few positive samples have been collected at a well after a distribution system positive sample.
3. (Not for Compliance Monitoring) When an application is made for installation of a new public water supply well, plans are submitted, inspections are performed, and water quality test well kits are taken to provide baseline testing on a broad spectrum of inorganic, organic, radiological, and microbiological parameters. As a service to Public Water Supply Systems, KDHE offers special study sampling and test well kit monitoring to help identify the best sources of water. Test wells are drilled and water quality is determined before permits are issued. These samples are not used for compliance determinations, but are considered special study samples specifically for the permitting process.
4. (Not for Compliance Monitoring) Special study samples are performed intermittently by systems for many different reasons. Normally these samples help systems identify or correct a problem of which they may or may not be aware. Often special studies are completed as part of an engineering firm's work when they are hired by the PWSS to make improvements or perform maintenance.

Drinking water facilities are tested on a three-year rotating cycle, so every facility in the state should be represented once in any consecutive three year window. **Table 33** presents results of 2012-2014 groundwater testing from both routine compliance monitoring samples and special

study sampling (not related to compliance monitoring) completed at water treatment plants and groundwater wells.

Treated groundwater source samples are from wells used to supply drinking water. Untreated groundwater source samples may be from wells used to supply drinking water, or may be locations where groundwater was tested for future possible use for drinking water supply. Note that Maximum Contaminant Levels (MCLs) do not apply to untreated drinking water, as treatment removes most contaminants, but counts of MCL exceedences are given as reference points.

Fluoride enters groundwater from natural deposits and by water additives via drinking water treatment known as fluoridation. Water systems that fluoridate their water are required to monitor their treated water more frequently than systems that have do not fluoridate their drinking water and have negligible or low levels of naturally occurring fluoride in their drinking water source.

The data provided here are presented only as an auxiliary to groundwater monitoring. Complete reporting on drinking water monitoring and compliance can be found on the KDHE Water Supply Section website at http://www.kdheks.gov/pws/annual_compliance_reports.htm.

Table 33. Results of groundwater monitoring associated with Public Water Supply Systems, 2012-2014

Monitoring Data Type	Parameter / Group	Sources	Total Samples	Samples with No Detects	Samples with Detects	Detects Nitrate ≤ 5 mg/L	Detects Nitrate >5 and ≤ 10 mg/L	Detect Sample Exceeding MCL*	Compliance Violations
Untreated Water	VOC	36	5608	5518	90	--	--	3	--
	SOC	35	1474	1430	44	--	--	0	--
	EDB	31	168	168	0	--	--	0	--
	Arsenic	46	111	19	92	--	--	21	--
	Fluoride	44	103	6	97	--	--	0	--
	Mercury	42	88	88	0	--	--	0	--
	Nitrate	50	131	28	103	49	33	21	--
	Selenium	43	90	22	68	--	--	1	--
	E. coli	235	1406	1357	49	--	--	N/A	--
Finished Drinking Water	VOC	505	19233	19158	75	--	--	16	0
	SOC	506	1040	940	100	--	--	0	0
	EDB	488	856	854	2	--	--	0	0
	Arsenic	474	964	164	800	--	--	77	71
	Fluoride	475	1234	24	1211	--	--	5	2
	Mercury	471	802	797	5	--	--	0	0
	Nitrate	600	4393	282	4112	1709	2167	236	218
	Selenium	473	829	85	744	--	--	21	17

This shows all detected parameters, whether they were measured for compliance or other purposes. Only the “Violations” column applies to actual compliance monitoring violations. Special studies or test well kit samples are never used to determine compliance or violations. Many untreated waters are tested but never developed into drinking water sources. Maximum Contaminant Level (MCL) for nitrate is 10 mg/L. EDB = ethyl dibromide. VOC = volatile organic compounds; SOC = synthetic organic compounds. *note that MCLs only apply to finished drinking water, but they are provided for untreated sources as a point of reference.

PART E. PUBLIC PARTICIPATION

As required by federal regulation and the Kansas continuing planning process, the 2016 303(d) list and associated methodology were subjected to public review. Formal public notice of the list was made via the Kansas Register on February 18, 2016. This notice included a link to the KDHE TMDL website, from which interested parties were able to review and download the entire 303(d) list and a detailed description of the listing methodology. KDHE held two public hearings regarding the list, one, in Topeka on March 15, 2016, at KDHE; the other on March 16, 2016, in Wichita at the KDHE District Office. One member of the public attended the hearing in Wichita, other attendees included agency staff. The comment period was held open until March 23, 2016. No comments received by the public required modification of the list.

Based on the proposed 2016 303(d) list, some 17 pollutant-watershed combinations addressing nutrient impairments in the Kansas Lower Republican and Lower Arkansas basins are slated for TMDL development over 2016-2017. These selections may be altered with changing priorities of the State environmental programs or contemporary issues (*e.g.* blue-green algae outbreak) at certain waters within the three basins in the upcoming cycle.

SOURCES CITED

National Oceanic and Atmospheric Administration. *National Centers for Environmental Information.* 2016. http://www.ncdc.noaa.gov/cag/time-series/us (accessed February 11, 2016).

Angelo, R.T., M.S. Cringan, and S.G. Haslouer. "Response of stream biological communities to agricultural disturbances in Kansas: An historical overview with comments on the potential for aquatic ecosystem restoration." *Proceedings of the Central Plains Bioassessment and Biocriteria Symposium.* Lawrence, KS: University of Kansas, 2003. 23.

Angelo, Robert T. "Impacts of declining stream flow on surface water quality." *Proceedings of the 11th Annual Conference on Water and the Future of Kansas.* Manhattan, KS, 1994. 1-2.

Arruda, J.A., et al. "Correspondence between urban areas and the concentrations of chlordane in fish from the Kansas River." *Bulletin of Environmental Contamination and Toxicology*, 1987: 39: 563-570.

Arruda, J.A., et al. *Results of follow-up chlordane fish tissue analysis from the Kansas River.* Topeka, KS: Kansas Department of Health and Environment, Bureau of Water Protection, 1987, 26 pp.

Carlson, R.E. "A trophic state index for lakes." *Limnology and Oceanography*, 1977: 22(2): 361-369.

Carney, E. "Relative influence of lake age and watershed land use on trophic state and water quality of artificial lakes in Kansas." *Lake and Reservoir Management*, 2009: 25(2): 199-207.

Chapman, S.S., et al. *Ecoregions of Nebraska and Kansas (1:1,950,000-scale map with color poster, descriptive text, summary tables, and photographs).* Reston, VA.: U.S. Geological Survey, 2001.

Chorus, I., and J. Bartram, . *Toxic Cyanobacteria in Water.* London, England: E&FN Spon., 1999.

Dahl, T.E. *Wetlands losses in the United States, 1780s to 1980s.* Washington, D.C.: U.S. Department of the Interior, Fish and Wildlife Service, 1990.

Diaz-Ramos, S., D.L. Stevens, and A.R. Olsen. *EMAP statistical methods manual, USEPA/620/R-96/002.* Corvallis, OR: U.S. Environmental Protection Agency, Office of Research and Development, NHEERL-Western Ecology Division, 1996, iv + 13 pp.

Dodds, W.K., E. Carney, and R.T. Angelo. "Determining ecoregional reference conditions for nutrients, Secchi depth, and chlorophyll-a in Kansas lakes and reservoirs." *Lake and Reservoir Management*, 2006: 22: 151-159.

Dodds, W.K., et al. "Eutrophication of U.S. freshwaters: analysis of potential economic damages." *Environmental Science and Techonology*, 2009: 43(1): 12-19.

Graham, J.L., K.A. Loftin, M.T. Meyer, and A.C. Ziegler. "Cyanotoxin mixtures and taste-and-odor compounds in cyanobacterial blooms from the midwestern United States." *Environmental Science and Techonology*, 2010: 44(19): 7361-7368.

Herlihy, A.T., D.P. Larsen, S.G. Paulsen, N.S. Urquhart, and B.J. Rosenbaum. "Designing a spatially balanced, randomized site selection process for regional stream surveys: The EMAP mid-Atlantic pilot study." *Environmental Monitoring and Assessment*, 2000: 63: 95-113.

Herlihy, A.T., J.L. Stoddard, and C. Burch-Johnson. "The relationship between stream chemistry and watershed lend cover data in the mid-Atlantic region, U.S." *Wate, Air, and Soil Pollution*, 1998: 105: 377-386.

Juracek, Kyle E. *Streamflow Characteristics and Trends at Selected Streamgages in Southwest and South-Central Kansas, Scientific Investigations Report 2015-5167 (30 pp).* Washington, DC: US Geological Survey, 2015.

Kansas Department of Wildlife, Parks, and Tourism. *Kansas Fishing Regulations 2015.* Topeka, KS, 2015.

Kansas Water Office. "Annual Drought Reports." Topeka, 2010-2014.

Kaufmann, P.R., A.T. Herlihy, M.E. Mitch, J.J. Messer, and W.S. Overton. "Chemical characteristics of streams in the eastern United States: I. Synoptic survey design, acid-base status and regional chemical patterns." *Water Resources research*, 1991: 27: 611-627.

KDHE. *Division of Environment Quality Management Plan Part III: Groundwater Quality Monitoring Program Quality Assurance Management Plan (Rev. 4).* Topeka, KS: Kansas Deparment of Health and Environment, 2000, 74 pp.

KDHE. *Division of Environment Quality Management Plan Part III: Lake and Wetland Monitoring Program Quality Assurance Management Plan (Rev. 4).* Topeka, KS: Kansas Department of Health and Environment, Division of Environment, 2014, 96 pp.

KDHE. *Division of Environment Quality Management Plan Part III: Stream Biological Monitoring Program Quality Assurance Management Plan (Rev. 4).* Topeka, KS: Kansas Department of Health and Environment, Division of Environment, 2012, 71 pp.

KDHE. *Division of Environment Quality Management Plan Part III: Stream Chemistry Monitoring Program Quality Assurance Management Plan (Rev. 3).* Topeka, KS: Kansas Department of Health and Environment, Division of Environment, 2014, 125 pp.

KDHE. *Division of Environment Quality Management Plan Part III: Stream Probabilistic Monitoring Program Quality Assurance Management Plan (Rev. 5).* Topeka, KS: Kansas Department of Health and Environment, Division of Environment, 2016, 91 pp.

KDHE. *Division of Environment Quality Management Plan Part III: Subwatersheds Monitoroing Program Quality Assurance Management Plan (Rev. 2).* Topeka, KS: Kansas Department of Health and Environment, 2014, 112 pp.

KDHE. *Division of Environment Quality Management Plan Part III: Surface Water Use Designation Program Quality Assurance Management Plan (Rev. 2).* Topeka, KS: Kansas Department of Health and Environment, Division of Environment, 2012, 173.

—. *Kansas Issues Revised Fish Consumption Advisories.* January 4, 2016. http://www.kdheks.gov/news/web_archives/2016/01042016.htm.

KDHE. "Kansas Surface Water Quality Standards. Kansas Administrative Regulations 28-16-28b through 28-16-28f." Topeka, KS, 2012.

KDHE. *Kansas Surface Water Register.* Topeka, KS: Kansas Deparment of Health and Environment, Division of Environment, 2013, 74.

KDHE. *Kansas water quality monitoring and assessment strategy, 2011-2015.* Topeka, KS: Kansas Department of Health and Environment, Bureau of Environmental Field Services, 2010, 59 pp.

KDHE. *Kansas wetland survey: Water quality and functioanl potential of public wetland areas.* Topeka, KS: Kansas Deparment of Health and Environment, Bureau of Environmental Field Services, 2002.

KDHE. *Regional ambient fish tissue monitoring program (RAFTMP) report summary for 1987.* Topeka, KS: Kansas Department of Health and Environment, Bureau of Water Protection, 1988, 12 pp.

KDHE. *State/EPA agreement fish tissue (Kansas target lakes study) analysis reprot summary for 1987.* Topeka, KS: Kansas Department of Health and Environment, Bureau of Water Protection, 1988, 17 pp.

KDWPT. *Kansas Fishing Atlas.* Topeka, KS: Kansas Department of Wildlife, Parks, and Tourism, 2016, 84 pp.

KWO. *Wetland and Riparian Areas Project (WRAP): classification of wetland and riparian areas in Kansas.* Topeka, KS: Kansas Water Office, 1992.

Lardner, H.A., B.D. Kirychuk, L. Braul, W.D. Willms, and J. Yarotski. "The effect of water quality on cattle performance on pasture." *Australian Journal of Agricultural Research*, 2005: 56: 97-104.

Larsen, D.P., K.W. Thornton, N.S. Urquhart, and S.G. Paulsen. "The role of sample surveys for monitoring the conditions of the nation's lakes." *Environmental Monitoring and Assessment*, 1994: 2: 101-134.

Messer, J.J., R.A. Linthurst, and W.S. Overton. "An EPA program for monitoring ecological status and trends." *Environmental Monitoring and Assessment*, 1991: 17: 67-78.

National Oceanic and Atmospheric Administration. *National Climatic Data Center.* 2016. http://www.ncdc.noaa.gov/temp-and-precip/state-temps/ (accessed February 11, 2016).

Olsen, A.R. *Kansas statewide stream survey design. March 11, 2009.* Unpublished communication: 800-point ArcGIS coverage and accompanying design documentation. , Corvallis, OR: U.S. Environmental Protection Agency, Office of Research and Development, NHEERL-Western Ecology Division, 2009.

Olsen, A.R. *Kansas statewide stream survey design. March 11, 2009.* Unpublished communication: 800-point ArcGIS coverage and accompanying design documentation, Corvallis, OR: US Environmental Protection Agency, Office of Research and Development, NHEERL-Western Ecology Division, 2009.

Perry, C.A., D.M. Wolock, and J.C. Artman. *Estimates of median flows for streams on the Kansas Surface Water Register; Water-Resources Investigations Report 02-4292.* Lawrence, KS: US Geological Survey, 2002.

State of Kansas. "A long term vision for the future of water supply in Kansas, developed based upon input from the citizens of Kansas. 81 pp." Topeka, KS, January 2015.

Stevens, D.L., and A.R. Olsen. "Spatially balanced sampling of natural resources." *Journal of the American Statistical Association*, 2004: 99: 262-278.

Stevens, D.L., and A.R. Olsen. "Variance estimation for spatially balanced samples of environmental resources." *Environmentrics*, 2003: 14: 593-610.

Strahler, A.N. "Quantitative analysis of watershed geomorphology." *American Geophysical Union Transactions*, 1957: 38L 913-920.

Tappa, D.J., J.L. Lanning-Rush, B.J. Klager, C.V. Hansen, and A. Ziegler. *Water Quality of the Little Arkansas River and Equus Beds Aquifer Before and Concurrent with Large-Scale Artificial Recharge, South-Central Kansas, 1995–2012 (Scientific Investigations Report 2015-5023).* Washington, D.C.: USGS, 2015.

Urquhart, N.S., S.G. Paulsen, and D.P. Larsen. "Monitoring for regional and policy-relevant trends over time." *Ecological Applications*, 1998: 8: 246-257.

USEPA. *Guidance for assessing chemical contaminant data for use in fish advisories. Volume 1:*

Fish sampling and analysis (3rd Edition), USEPA 823-B-00-007. Washington, D.C.: U.S. Environmental Protection Agency, Office of Science and Technology and Office of Water, 2000, 360 pp + appendices.

USEPA. *Guidance for assessing chemical contaminant data for use in fish advisories. Volume 2: Risk assessment and fish consumption limits (3rd Edition).* Washington, D.C.: U.S. Environmental Protection Agency, Office of Science and Technology and Office of Water, 2000, 257 pp + appendices.

USEPA. *Wadeable streams assessment site evaluation guidelines. USEPA841-B-04-006* . Washington, D.C.. 15 pp: U.S. Environmental Protection Agency, Office of Water and Office of Environmental Information, 2004, 15 pp.

USEPA. *Wadeable Streams Assessment: A collaborative survey of the nation's streams. USEPA 841-B-06-002 r*. Washington, D.C.: U.S. Environmental Protection Agency, Office of Research and Development and Office of Wate, 2006, ii + 98 pp.

Willms, W.D., et al. "Effects of water quality on cattle performance." *Journal of Range Management*, 2002: 55: 452-260.

Young, D.P., R.W. Buddemeier, D.O. Whittemore, and H. Rubin. *Final Summary and Data Report: The Equus Beds Mineral Intrusion Project (Open-file Report 2000-30).* Lawrence, KS: Kansas Geological Survey, 2001.

APPENDICES

Appendix A. Routine and Supplemental Parameters

APPENDIX A-1: WATER CHEMISTRY PARAMETERS

Routine and supplemental water chemistry and related parameters analyzed by the Targeted Stream Chemistry Monitoring Program, the Lake and Wetland Program, and the Probabilistic Stream Monitoring Program. R = routine / s = supplemental / . = N/A

TYPE	PARAMETER	Targeted Stream Chemistry Program	Probabilistic Stream Program	Lake and Wetland Program
Inorganic / Composite	Alkalinity, total (as CaCO3)	R	R	R
Inorganic / Composite	Aluminum, total recoverable	R	R	R
Inorganic / Composite	Ammonia, total (as N)	R	R	R
Inorganic / Composite	Antimony, total recoverable	R	R	R
Inorganic / Composite	Arsenic, total recoverable	R	R	R
Inorganic / Composite	Barium, total recoverable	R	R	R
Inorganic / Composite	Beryllium, total recoverable	R	R	R
Inorganic / Composite	Boron, total recoverable	R	R	R
Inorganic / Composite	Bromide	R	R	R
Inorganic / Composite	Cadmium, total recoverable	R	R	R
Inorganic / Composite	Calcium, total recoverable	R	R	R
Inorganic / Composite	Carbon, total inorganic (calculated)	.	.	R
Inorganic / Composite	Carbon, total organic	R	R	R
Inorganic / Composite	Chloride	R	R	R
Inorganic / Composite	Chromium, total recoverable	R	R	R
Inorganic / Composite	Cobalt, total recoverable	R	R	R
Inorganic / Composite	Conductivity (field)	R	.	.
Inorganic / Composite	Copper, total recoverable	R	R	R
Inorganic / Composite	Dissolved oxygen	R	R	R
Inorganic / Composite	Fluoride	R	R	R
Inorganic / Composite	Hardness, total (as CaCO3)	R	R	R
Inorganic / Composite	Iron, total recoverable	R	R	R
Inorganic / Composite	Kjeldahl nitrogen	R	R	R
Inorganic / Composite	Lead, total recoverable	R	R	R
Inorganic / Composite	Magnesium, total recoverable	R	R	R
Inorganic / Composite	Manganese, total recoverable	R	R	R
Inorganic / Composite	Mercury, total	R	R	R
Inorganic / Composite	Molybdenum, total recoverable	R	R	R

TYPE	PARAMETER	Targeted Stream Chemistry Program	Probabilistic Stream Program	Lake and Wetland Program
Inorganic / Composite	Nickel, total recoverable	R	R	R
Inorganic / Composite	Nitrate (as N)	R	R	R
Inorganic / Composite	Nitrite (as N)	R	R	R
Inorganic / Composite	pH (lab)	s	s	s
Inorganic / Composite	pH (field)	R	R	R
Inorganic / Composite	Phosphate, ortho- (as P)	R	R	R
Inorganic / Composite	Phosphorus, total (as P)	R	R	R
Inorganic / Composite	Potassium, total recoverable	R	R	R
Inorganic / Composite	Selenium, total recoverable	R	R	R
Inorganic / Composite	Silica, total recoverable	R	R	R
Inorganic / Composite	Silver, total recoverable	R	R	R
Inorganic / Composite	Sodium, total recoverable	R	R	R
Inorganic / Composite	Specific conductance	R	R	R
Inorganic / Composite	Strontium, total recoverable	R	R	R
Inorganic / Composite	Sulfate	R	R	R
Inorganic / Composite	Temperature	R	R	R
Inorganic / Composite	Temperature (field)	R	R	R
Inorganic / Composite	Thallium, total recoverable	R	R	R
Inorganic / Composite	Total dissolved solids (calculated)	R	R	R
Inorganic / Composite	Total suspended solids	R	R	R
Inorganic / Composite	Turbidity	R	R	R
Inorganic / Composite	Uranium, total recoverable	R	R	R
Inorganic / Composite	Vanadium, total recoverable	R	R	R
Inorganic / Composite	Zinc, total recoverable	R	R	R
Microbiological	*Escherichia coli (E. coli)*	R	R	R
Organic	Acetochlor	R	R	R
Organic	Alachlor	R	R	R
Organic	Aldrin	R	R	R
Organic	Alpha BHC	R	R	R
Organic	Atrazine (Aatrex)	R	R	R
Organic	beta-BCH	R	R	R
Organic	Bromacil	R	R	R
Organic	Butachlor	R	R	R
Organic	Carbofuran (Furadan)	R	R	R
Organic	Chlordane	R	R	R
Organic	Chlorpyrifos (Dursban)	s	s	.
Organic	Cyanazine (Bladex)	R	R	R
Organic	DCPA (Dacthal)	R	R	R

TYPE	PARAMETER	Targeted Stream Chemistry Program	Probabilistic Stream Program	Lake and Wetland Program
Organic	Deethylatrazine	s	s	s
Organic	Deisoproplyatrazine	s	s	s
Organic	Delta BHC	R	R	R
Organic	Diazinon	s	s	.
Organic	Dieldrin	R	R	R
Organic	Endosulfan I	R	R	R
Organic	Endosulfan II	R	R	R
Organic	Endosulfan sulfate	R	R	R
Organic	Endrin	R	R	R
Organic	Gamma BHC (Lindane)	R	R	R
Organic	Heptachlor	R	R	R
Organic	Heptachlor epoxide	R	R	R
Organic	Hexachlorobenzene	R	R	R
Organic	Hexachlorocyclopentadiene	R	R	R
Organic	Methoxychlor	R	R	R
Organic	Metolachlor (Dual)	R	R	R
Organic	Metribuzin (Sencor)	R	R	R
Organic	p,p'-DDD	R	R	R
Organic	p,p'-DDE	R	R	R
Organic	p,p'-DDT	R	R	R
Organic	PCB-1016	R	R	R
Organic	PCB-1221	R	R	R
Organic	PCB-1232	R	R	R
Organic	PCB-1242	R	R	R
Organic	PCB-1248	R	R	R
Organic	PCB-1254	R	R	R
Organic	PCB-1260	R	R	R
Organic	Pentachlorophenol	s	s	.
Organic	Prometon (Pramitol)	R	R	R
Organic	Propachlor (Ramrod)	R	R	R
Organic	Propazine (Milogard)	R	R	R
Organic	Simazine	R	R	R
Organic	Toxaphene	R	R	R
Other	Algal taxonomy (field)	s	R	R
Other	Chlorophyll-a	s	R	R
Other	Macrophyte abundance (field)	.		R
Other	Pheophytin-a	s	s	R

TYPE	PARAMETER	Targeted Stream Chemistry Program	Probabilistic Stream Program	Lake and Wetland Program
Other	Photosynthetically active radiation (PAR)*	.	.	s
Other	Secchi depth (field)*	.		R
Radiological	Actinium-228	s	.	.
Radiological	Americum-241	s	.	.
Radiological	Antimony-125	s	.	.
Radiological	Barium-140	s	.	.
Radiological	Beryllium-7	s	.	.
Radiological	Cerium-141	s	.	.
Radiological	Cerium-144	s	.	.
Radiological	Cesium-134	s	.	.
Radiological	Cesium-136	s	.	.
Radiological	Cesium-137	s	.	.
Radiological	Cobalt-57	s	.	.
Radiological	Cobalt-60	s	.	.
Radiological	Gross alpha	s	.	.
Radiological	Gross beta	s	.	.
Radiological	Indium-111	s	.	.
Radiological	Iodine-123	s	.	.
Radiological	Iodine-131	s	.	.
Radiological	Iodine-132	s	.	.
Radiological	Iodine-133	s	.	.
Radiological	Iron-59	s	.	.
Radiological	Lanthanum-140	s	.	.
Radiological	Manganese-54	s	.	.
Radiological	Molybdenum-99	s	.	.
Radiological	Neodymium-147	s	.	.
Radiological	Neptunium-239	s	.	.
Radiological	Niobium-95	s	.	.
Radiological	Potassium-40	s	.	.
Radiological	Radium-226	s	.	.
Radiological	Ruthenium-103	s	.	.
Radiological	Ruthenium-106	s	.	.
Radiological	Silver-110m	s	.	.
Radiological	Technetium-99m	s	.	.
Radiological	Thorium-228	s	.	.
Radiological	Tritium	s	.	.
Radiological	Ytterbium-169	s	.	.

TYPE	PARAMETER	Targeted Stream Chemistry Program	Probabilistic Stream Program	Lake and Wetland Program
Radiological	Zinc-65	s	.	.
Radiological	Zirconium-95	s	.	.

APPENDIX A-2: FISH TISSUE PARAMETERS

Routine fish tissue parameters analyzed by the USEPA Region 7 laboratories for the Fish Tissue Contamination Program and Stream Probabilistic Monitoring Programs. R = routine / . = N/A

Type	**Parameter**	**Fillet (through 2013 only)**	**Whole-fish (through 2013 only)**	**Fillet and Whole-fish (Current parameters)**	**Plug (2011 to present)**
inorganic	Cadmium	R	R	.	.
inorganic	Lead	R	R	.	.
inorganic	Mercury	R	R	R	R
inorganic	Selenium	R	R	.	.
organic	1,2,4,5 -Tetrachlorobenzene	.	R	.	.
organic	p,p'-DDD	R	R	R	.
organic	p,p'-DDE	R	R	R	.
organic	p,p'-DDT	R	R	R	.
organic	Dieldrin	R	R	R	.
organic	Heptachlor	R	R	.	.
organic	Heptachlor epoxide	R	R	.	.
organic	Hexachlorobenzene	R	R	.	.
organic	gamma-Hexachlorocyclohexane (gamma-BHC)	R	R	.	.
organic	Mirex	.	R	.	.
organic	PCB-1248	R	R	R	.
organic	PCB-1254	R	R	R	.
organic	PCB-1260	R	R	R	.
organic	Pentachloroanisole	R	R	.	.
organic	Pentachlorobenzene	.	R	.	.
organic	Technical Chlordane	R	R	.	.
organic	Oxychlordane	R	.	R	.
organic	cis-Chlordanet	R	.	R	.
organic	trans-chlordane	R	.	R	.
organic	cis-Nonachlor	R	.	R	.
organic	trans-Nonachlor	R	.	R	.
organic	Trifluralin (Treflan)	R	R	.	.

Appendix B. 303(D) LIST

Appendix B contains the most recently completed 303(d) list for the state of Kansas. Current approval status may be found at http://www.kdheks.gov/tmdl. The first part, B-1, is a list of currently impaired waters, Categories 3, 4, and 5. The second part, Appendix B-2, is a list of waters removed from the impaired list, now moved to Category 2.

Waterbodies are listed alphabetically within HUC-8 watersheds, HUC-8s are listed numerically within river basins, and basins are listed alphabetically. More information on specific waterbodies can be found in the Kansas Surface Water Register (KDHE, 2013c). Station prefixes refer to waterbody types. Stream Chemistry (SC) stations, Lake Monitoring (LM) stations, or National Pollutant Discharge Elimination System (NPDES) facilities, or in one case, a USGS monitoring station. Other codes used in this appendix are listed in the tables below:

Impairment Code	Impairment
Ala	Alachlor
AP	Aquatic Plants
Ars	Arsenic
Atr	Atrazine
B	Boron
Be	Berylium
Bio	Biology
Bio_Sed	Biology/Sediment
Cd	Cadmium
Chl	Chlordane
Cl	Chloride
Cu	Copper
Diaz	Diazinon
DO	Dissolved Oxygen
ECB	E. coli
EU	Eutrophication
F	Fluoride
FCB	Fecal Coli
GA	Gross Alpha
Hg	Mercury
NH3	Ammonia
NO23	Nitrate
Pb	Lead
PCB	PCB
Perch	Perchlorate
pH	pH
Se	Selenium
Silt	Siltation
SO4	Sulfate
Temp	Temperature
TP	Total Phosphorus
TSS	Total Suspended Solids
Zn	Zinc

Waterbody Code	Waterbody Type
F	Facility
L	Lake
R	Watershed
W	Wetland

Use Code	Designated Use
AL	Aquatic Life
FP	Food Procurement
REC	Recreation
WS	Water Supply

Basin Code	Basin
CI	Cimarron
KR	Kansas Lower Republican
LA	Lower Arkansas
MC	Marais des Cygnes
MO	Missouri
NE	Neosho
SO	Solomon
SS	Smoky Hill- Saline
UA	Upper Arkansas
UR	Upper Republican
VE	Verdigris
WA	Walnut

APPENDIX B-1: CURRENTLY IMPAIRED WATERS

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
CI	11040002	Upper Cimarron	Point of Rocks Lake (Moss Lake West)	L	LM060501	MT	3	DO	
CI	11040002	Upper Cimarron	Point of Rocks Lake (Moss Lake West)	L	LM060501	MT	5	EU	2023
CI	11040002	Upper Cimarron	Point of Rocks Lake (Moss Lake West)	L	LM060501	MT	5	F	2023
CI	11040002	Upper Cimarron	Point of Rocks Lake (Moss Lake West)	L	LM060501	MT	5	SO4	2023
CI	11040006	Upper Cimarron-Liberal	Cimarron R Near Forgan, Oklahoma	R	SC222	ME, MT, SV, SW	5	DO	2023
CI	11040006	Upper Cimarron-Liberal	Cimarron R Near Forgan, Oklahoma	R	SC222	ME, MT, SV, SW	5	Se	2023
CI	11040006	Upper Cimarron-Liberal	Cimarron R Near Forgan, Oklahoma	R	SC222	ME, MT, SV, SW	5	TP	2023
CI	11040006	Upper Cimarron-Liberal	Cimarron R Near Forgan, Oklahoma	R	SC222	ME, MT, SV, SW	4a	Cl	Low
CI	11040006	Upper Cimarron-Liberal	Cimarron R Near Forgan, Oklahoma	R	SC222	ME, MT, SV, SW	4a	pH	Low
CI	11040007	Crooked Cr	Crooked Cr Near Englewood	R	SC600	GY, HS, ME	3	ECB	
CI	11040007	Crooked Cr	Crooked Cr Near Englewood	R	SC600	GY, HS, ME	5	F	2023
CI	11040007	Crooked Cr	Crooked Cr Near Englewood	R	SC600	GY, HS, ME	4a	Cl	Low
CI	11040007	Crooked Cr	Lake Meade State Park	L	LM010601	ME	5	F	2023
CI	11040007	Crooked Cr	Lake Meade State Park	L	LM010601	ME	4a	AP	High
CI	11040007	Crooked Cr	Lake Meade State Park	L	LM010601	ME	4a	DO	High
CI	11040007	Crooked Cr	Lake Meade State Park	L	LM010601	ME	4a	EU	High

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
CI	11040007	Crooked Cr	Lake Meade State Park	L	LM010601	ME	4a	pH	High
CI	11040008	Upper Cimarron-Bluff	Big Sandy Cr Near Ashland	R	SC738	ME, CA	5	DO	2023
CI	11040008	Upper Cimarron-Bluff	Big Sandy Cr Near Ashland	R	SC738	ME, CA	5	F	2023
CI	11040008	Upper Cimarron-Bluff	Big Sandy Cr Near Ashland	R	SC738	ME, CA	4a	Cl	Low
CI	11040008	Upper Cimarron-Bluff	Big Sandy Cr Near Ashland	R	SC738	ME, CA	4a	SO4	Low
CI	11040008	Upper Cimarron-Bluff	Bluff Cr Near Protection	R	SC593	CA, CM	5	Cl	2023
CI	11040008	Upper Cimarron-Bluff	Cavalry Cr Near Protection	R	SC624	KW, CM	4a	ECB	Medium
CI	11040008	Upper Cimarron-Bluff	Cimarron R Near Protection	R	SC592	ME, CA	4a	Cl	Low
CI	11040008	Upper Cimarron-Bluff	Clark Co. SFL	L	LM010101	CA	5	EU	2023
CI	11040008	Upper Cimarron-Bluff	Day Cr Near Sitka	R	SC701	CA, CM	5	DO	2023
CI	11040008	Upper Cimarron-Bluff	Day Cr Near Sitka	R	SC701	CA, CM	4a	Cl	Low
CI	11040008	Upper Cimarron-Bluff	Lake Coldwater	L	LM042601	CM	4a	EU	Low
CI	11040008	Upper Cimarron-Bluff	St. Jacobs Well (Big Basin W.A.)	L	LM060001	CA	5	F	2023
CI	11040008	Upper Cimarron-Bluff	St. Jacobs Well (Big Basin W.A.)	L	LM060001	CA	4a	EU	High
KR	10250016	Middle Republican	Lovewell Lake	L	LM015001	JW	4a	EU	Low
KR	10250016	Middle Republican	Lovewell Lake	L	LM015001	JW	4a	pH	Low
KR	10250016	Middle Republican	Republican R Near Hardy, Nebraska	R	SC231	JW, SM	5	Bio	2023
KR	10250016	Middle Republican	Republican R Near Hardy, Nebraska	R	SC231	JW, SM	5	GA	2023
KR	10250016	Middle Republican	Republican R Near Hardy, Nebraska	R	SC231	JW, SM	5	TP	2023
KR	10250016	Middle Republican	Republican R Near Hardy, Nebraska	R	SC231	JW, SM	4a	ECB	Low
KR	10250016	Middle Republican	Republican R Near Hardy, Nebraska	L	SC231	JW, SM	4a	EU	High
KR	10250016	Middle Republican	White Rock Cr Near Burr Oak	R	SC508	JW, SM	5	Ars	2023
KR	10250016	Middle Republican	White Rock Cr Near Burr Oak	R	SC508	JW, SM	5	TP	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
KR	10250016	Middle Republican	White Rock Cr Near Burr Oak	R	SC508	JW, SM	5	TSS	2023
KR	10250016	Middle Republican	White Rock Cr Near Burr Oak	R	SC508	JW, SM	4a	ECB	Low
KR	10250016	Middle Republican	White Rock Cr Near Burr Oak	R	SC508	JW, SM	4a	Se	Low
KR	10250016	Middle Republican	White Rock Cr Near Burr Oak	R	SC508	JW, SM	4a	SO4	Low
KR	10250017	Lower Republican	Belleville City Lake	L	LM060701	RP	4a	EU	Low
KR	10250017	Lower Republican	Buffalo Cr Near Concordia	R	SC509	JW, CD	5	Ars	2023
KR	10250017	Lower Republican	Buffalo Cr Near Concordia	R	SC509	JW, CD	5	Se	2023
KR	10250017	Lower Republican	Buffalo Cr Near Concordia	R	SC509	JW, CD	5	SO4	2023
KR	10250017	Lower Republican	Buffalo Cr Near Concordia	R	SC509	JW, CD	5	TP	2019
KR	10250017	Lower Republican	Buffalo Cr Near Concordia	R	SC509	JW, CD	5	TSS	2023
KR	10250017	Lower Republican	Buffalo Cr Near Concordia	L	SC509	JW, CD	4a	EU	High
KR	10250017	Lower Republican	Buffalo Cr Near Concordia	R	SC509	JW, CD	4a	FCB	Low
KR	10250017	Lower Republican	Elm Cr Near Ames	R	SC709	CD	3	ECB	
KR	10250017	Lower Republican	Elm Cr Near Ames	R	SC709	CD	5	Cu	2023
KR	10250017	Lower Republican	Elm Cr Near Ames	R	SC709	CD	5	TP	2019
KR	10250017	Lower Republican	Elm Cr Near Ames	L	SC709	CD	4a	EU	High
KR	10250017	Lower Republican	Five Cr Near Clay Center	R	SC711	CD, CY	5	SO4	2023
KR	10250017	Lower Republican	Five Cr Near Clay Center	L	SC711	CD, CY	4a	EU	High
KR	10250017	Lower Republican	Jamestown W.A.	L	LM052801	CD	3	Ars	
KR	10250017	Lower Republican	Jamestown W.A.	L	LM052801	CD	4a	EU	Low
KR	10250017	Lower Republican	Jamestown W.A.	L	LM052801	CD	4a	FCB	Low
KR	10250017	Lower Republican	Jamestown W.A.	L	LM052801	CD	4a	pH	Low
KR	10250017	Lower Republican	Jamestown W.A.	L	LM052801	CD	4a	Silt	Low
KR	10250017	Lower Republican	Milford Lake	L	LM019001	CY, RL, GE	4a	DO	High
KR	10250017	Lower Republican	Milford Lake	L	LM019001	CY, RL, GE	4a	EU	High
KR	10250017	Lower Republican	Mulberry Cr Near Clifton	R	SC710	CD, CY	5	Cu	2023
KR	10250017	Lower Republican	Mulberry Cr Near Clifton	R	SC710	CD, CY	5	TP	2019
KR	10250017	Lower Republican	Mulberry Cr Near Clifton	L	SC710	CD, CY	4a	EU	High
KR	10250017	Lower Republican	Peats Cr Near Clifton	R	SC649	WS	5	Cu	2023
KR	10250017	Lower Republican	Peats Cr Near Clifton	R	SC649	WS	5	TP	2019

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
KR	10250017	Lower Republican	Peats Cr Near Clifton	L	SC649	WS	4a	EU	High
KR	10250017	Lower Republican	Republican R Near Clay Center	R	SC503	CY	5	Bio	2022
KR	10250017	Lower Republican	Republican R Near Clay Center	R	SC503	CY	5	TP	2019
KR	10250017	Lower Republican	Republican R Near Clay Center	R	SC503	CY	5	TSS	2023
KR	10250017	Lower Republican	Republican R Near Clay Center	R	SC504	RP, WS, CD, CY	5	TP	2019
KR	10250017	Lower Republican	Republican R Near Clay Center	R	SC504	RP, WS, CD, CY	5	TSS	2023
KR	10250017	Lower Republican	Republican R Near Clay Center	R	SC503	CY	4a	ECB	Medium
KR	10250017	Lower Republican	Republican R Near Clay Center	L	SC503	CY	4a	EU	High
KR	10250017	Lower Republican	Republican R Near Clay Center	R	SC504	RP, WS, CD, CY	4a	ECB	Medium
KR	10250017	Lower Republican	Republican R Near Clay Center	L	SC504	RP, WS, CD, CY	4a	EU	High
KR	10250017	Lower Republican	Republican R Near Rice	R	SC510	JW, RP, CD	3	Bio	New
KR	10250017	Lower Republican	Republican R Near Rice	R	SC510	JW, RP, CD	5	TP	2019
KR	10250017	Lower Republican	Republican R Near Rice	R	SC510	JW, RP, CD	4a	ECB	Medium
KR	10250017	Lower Republican	Republican R Near Rice	L	SC510	JW, RP, CD	4a	EU	High
KR	10250017	Lower Republican	Rimrock Park Lake	L	LM070501	GE	4a	DO	Medium
KR	10250017	Lower Republican	Rimrock Park Lake	L	LM070501	GE	4a	EU	Medium
KR	10250017	Lower Republican	Salt Cr Near Hollis	R	SC650	RP	5	Cl	2023
KR	10250017	Lower Republican	Salt Cr Near Hollis	R	SC650	RP	5	TP	2019
KR	10250017	Lower Republican	Salt Cr Near Hollis	R	SC650	RP	5	TSS	2023
KR	10250017	Lower Republican	Salt Cr Near Hollis	R	SC650	RP	4a	DO	High
KR	10250017	Lower Republican	Salt Cr Near Hollis	R	SC650	RP	4a	ECB	High

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
KR	10250017	Lower Republican	Salt Cr Near Hollis	L	SC650	RP	4a	EU	High
KR	10250017	Lower Republican	Wolf Cr Near Concordia	R	SC707	CD	3	ECB	
KR	10250017	Lower Republican	Wolf Cr Near Concordia	R	SC707	CD	5	Ars	2023
KR	10250017	Lower Republican	Wolf Cr Near Concordia	R	SC707	CD	5	DO	2022
KR	10250017	Lower Republican	Wolf Cr Near Concordia	R	SC707	CD	5	TP	2019
KR	10250017	Lower Republican	Wolf Cr Near Concordia	L	SC707	CD	4a	EU	High
KR	10270101	Upper Kansas	Kansas R Near Ogden	R	SC518	RL, GE	5	TP	2016
KR	10270101	Upper Kansas	Kansas R Near Ogden	R	SC518	RL, GE	5	TSS	2023
KR	10270101	Upper Kansas	Kansas R Near Ogden	R	SC518	RL, GE	4a	ECB	Medium
KR	10270101	Upper Kansas	Kansas R Near Ogden	R	SC518	RL, GE	4a	SO4	Low
KR	10270101	Upper Kansas	Ogden City Lake	L	LM011701	RL	4a	EU	Low
KR	10270101	Upper Kansas	Sevenmile Cr Near Ogden	R	SC759	RL	3	Bio	
KR	10270101	Upper Kansas	Wildcat Cr Near Manhattan	R	SC652	RL	4a	DO	High
KR	10270101	Upper Kansas	Wildcat Cr Near Manhattan	R	SC652	RL	4a	ECB	High
KR	10270102	Middle Kansas	Alma City Lake	L	LM050001	WB	3	EU	
KR	10270102	Middle Kansas	Central Park Lake	L	LM060901	SN	4a	EU	Low
KR	10270102	Middle Kansas	Cross Cr Near Rossville	R	SC551	JA, PT	4a	ECB	High
KR	10270102	Middle Kansas	Deep Cr	R	SB410	RL	3	Bio	New
KR	10270102	Middle Kansas	Deep Cr Near Manhattan	R	SC647	RL	3	Bio	
KR	10270102	Middle Kansas	Dornwood Park Lake	L	LM062301	SN	3	EU	
KR	10270102	Middle Kansas	Gage Park Lake	L	LM061101	SN	4a	EU	Low
KR	10270102	Middle Kansas	Halfday Cr	R	SB376	SN, JA	5	Bio	2023
KR	10270102	Middle Kansas	Illinois Cr Near Alma	R	SC726	WB	3	Bio	
KR	10270102	Middle Kansas	Kansas R At Topeka	R	SC258	PT, SN, WB	4a	FCB	Medium
KR	10270102	Middle Kansas	Kansas R At Wamego	R	SC260	Rl, PT, WB	5	Bio	2022
KR	10270102	Middle Kansas	Kansas R At Wamego	R	SC260	Rl, PT, WB	5	TP	2016
KR	10270102	Middle Kansas	Kansas R At Wamego	R	SC260	Rl, PT, WB	5	TSS	2023
KR	10270102	Middle Kansas	Kansas R At Wamego	R	SC260	Rl, PT, WB	4a	FCB	Medium

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
KR	10270102	Middle Kansas	Kansas R At Willard	R	SC259	PT, SN, WB	5	Bio	2022
KR	10270102	Middle Kansas	Kansas R At Willard	R	SC259	PT, SN, WB	5	TP	2016
KR	10270102	Middle Kansas	Kansas R At Willard	R	SC259	PT, SN, WB	5	TSS	2023
KR	10270102	Middle Kansas	Kansas R At Willard	R	SC259	PT, SN, WB	4a	ECB	High
KR	10270102	Middle Kansas	Lake Shawnee	L	LM012201	SN	4a	EU	High
KR	10270102	Middle Kansas	Lost Cr Near Belvue	R	SC755	PT	5	Ars	2023
KR	10270102	Middle Kansas	Lost Cr Near Belvue	R	SC755	PT	5	Se	2023
KR	10270102	Middle Kansas	Mission Cr Near Valencia	R	SC648	SN, WB	5	Bio	2023
KR	10270102	Middle Kansas	Mission Cr Near Valencia	R	SC648	SN, WB	5	ECB	2023
KR	10270102	Middle Kansas	Muddy Cr Near Grantville	R	SC639	JA, JF, SN	5	ECB	2023
KR	10270102	Middle Kansas	Myer's Lake	L	LM075201	SN	3	pH	
KR	10270102	Middle Kansas	Myer's Lake	L	LM075201	SN	4a	EU	Low
KR	10270102	Middle Kansas	Pillsbury Crossing W.A.	L	LM020301	RL	3	Hg	
KR	10270102	Middle Kansas	Pottawatomie Co. SFL #1	L	LM012901	PT	5	DO	2022
KR	10270102	Middle Kansas	Pottawatomie Co. SFL #1	L	LM012901	PT	5	EU	2022
KR	10270102	Middle Kansas	Rock Cr Near Louisville	R	SC645	PT	4a	ECB	High
KR	10270102	Middle Kansas	Shunganunga Cr Near Topeka	R	SC238	SN	3	Diaz	
KR	10270102	Middle Kansas	Shunganunga Cr Near Topeka	R	SC238	SN	5	TP	2017
KR	10270102	Middle Kansas	Shunganunga Cr Near Topeka	R	SC238	SN	4a	ECB	High
KR	10270102	Middle Kansas	Soldier Cr Near Circleville	R	SC299	JA, NM	4a	Bio	High
KR	10270102	Middle Kansas	Soldier Cr Near Delia	R	SC101	NM, JA	5	Atr	2023
KR	10270102	Middle Kansas	Soldier Cr Near Delia	R	SC101	NM, JA	5	TSS	2023
KR	10270102	Middle Kansas	Soldier Cr Near Delia	R	SC101	NM, JA	4a	Bio	High

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
KR	10270102	Middle Kansas	Soldier Cr Near Topeka	R	SC239	JA, SN	3	Atr	New
KR	10270102	Middle Kansas	Soldier Cr Near Topeka	R	SC239	JA, SN	5	ECB	2023
KR	10270102	Middle Kansas	Topeka Public Golf Course Lake	L	LM050101	SN	5	EU	2023
KR	10270102	Middle Kansas	Vermillion Cr Near Louisville	R	SC520	PT, SN, WB	5	Atr	2023
KR	10270102	Middle Kansas	Vermillion Cr Near Louisville	R	SC520	PT, SN, WB	5	Bio	2023
KR	10270102	Middle Kansas	Vermillion Cr Near Louisville	R	SC520	PT, SN, WB	4a	ECB	High
KR	10270102	Middle Kansas	Vermillion Cr Near Onaga	R	SC681	NM, PT	4a	ECB	High
KR	10270102	Middle Kansas	Wamego City Lake	L	LM062101	PT	3	Hg	
KR	10270102	Middle Kansas	Wamego City Lake	L	LM062101	PT	4a	EU	Low
KR	10270102	Middle Kansas	Warren Park Lake	L	LM062001	SN	4a	AP	Low
KR	10270102	Middle Kansas	Warren Park Lake	L	LM062001	SN	4a	EU	Low
KR	10270102	Middle Kansas	West Branch Mill Cr Near Alma	R	SC506	GE, WB	3	Bio	
KR	10270103	Delaware	Atchison Co. Park Lake	L	LM060601	AT	5	EU	2023
KR	10270103	Delaware	Atchison Co. Park Lake	L	LM060601	AT	5	Silt	2023
KR	10270103	Delaware	Delaware R at Hwy 36	R	SB352	BR, NM	3	Bio	New
KR	10270103	Delaware	Delaware R Near Half Mound	R	SC554	NM, BR, JA, AT	5	Bio	2022
KR	10270103	Delaware	Delaware R Near Half Mound	R	SC554	NM, BR, JA, AT	5	TP	2019
KR	10270103	Delaware	Delaware R Near Half Mound	R	SC554	NM, BR, JA, AT	4a	ECB	High
KR	10270103	Delaware	Elk Cr Near Larkinburg	R	SC604	JA, PT	5	TP	2019
KR	10270103	Delaware	Elk Cr Near Larkinburg	R	SC604	JA, PT	4a	ECB	High
KR	10270103	Delaware	Elkhorn Lake	L	LM061001	JA	5	EU	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
KR	10270103	Delaware	Grasshopper Cr Near Muscotah	R	SC603	BR, AT	5	TP	2019
KR	10270103	Delaware	Grasshopper Cr Near Muscotah	R	SC603	BR, AT	4a	Atr	Low
KR	10270103	Delaware	Grasshopper Cr Near Muscotah	R	SC603	BR, AT	4a	ECB	High
KR	10270103	Delaware	Lake Jayhawk	L	LM039701	JF	3	EU	
KR	10270103	Delaware	Little Lake	L	LM062601	BR	4a	EU	Low
KR	10270103	Delaware	Mission Lake	L	LM013601	BR	4a	Atr	High
KR	10270103	Delaware	Mission Lake	L	LM013601	BR	4a	EU	High
KR	10270103	Delaware	Mission Lake	L	LM013601	BR	4a	Silt	High
KR	10270103	Delaware	Nebo SFL	L	LM061501	JA	5	EU	2023
KR	10270103	Delaware	Perry Lake	L	LM029001	JA, JF	4a	EU	High
KR	10270103	Delaware	Perry W.A. Wetland	L	LM029041	JF	4a	DO	Low
KR	10270103	Delaware	Perry W.A. Wetland	L	LM029041	JF	4a	EU	High
KR	10270103	Delaware	Prairie Lake	L	LM061901	JA	5	EU	2022
KR	10270103	Delaware	Rock Cr Near Rock Cr	R	SC684	JA, JF	3	ECB	
KR	10270103	Delaware	Sabetha Watershed Lake (Niehues)	L	LM075101	NM	4a	EU	Low
KR	10270103	Delaware	Straight Cr Near Larkinburg	R	SC686	NM, JA	4a	ECB	High
KR	10270104	Lower Kansas	Antioch Park Lake	L	LM067701	JO	5	EU	2023
KR	10270104	Lower Kansas	Antioch Park Lake	L	LM067701	JO	4a	Chl	Low
KR	10270104	Lower Kansas	Baker Wetlands	W	LM014401	DG	5	EU	2022
KR	10270104	Lower Kansas	Baker Wetlands	W	LM014401	DG	5	Pb	2023
KR	10270104	Lower Kansas	Baker Wetlands	W	LM014401	DG	5	pH	2022
KR	10270104	Lower Kansas	Baker Wetlands	W	LM014401	DG	4a	DO	High
KR	10270104	Lower Kansas	Buck Cr Near Williamstown	R	SC677	JF	4a	FCB	Medium
KR	10270104	Lower Kansas	Captain Cr Near Eudora	R	SC638	DG, JO	3	ECB	
KR	10270104	Lower Kansas	Captain Cr Near Eudora	R	SC638	DG, JO	5	Atr	2023
KR	10270104	Lower Kansas	Carbondale West Lake	L	LM060801	OS	5	EU	2022

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
KR	10270104	Lower Kansas	Cedar Cr Near Cedar Junction	R	SC252	JO	5	TP	2017
KR	10270104	Lower Kansas	Cedar Cr Near Cedar Junction	R	SC252	JO	4a	ECB	High
KR	10270104	Lower Kansas	Cedar Cr Near Cedar Junction	R	SC252	JO	4a	NO23	High
KR	10270104	Lower Kansas	Cedar Lake	L	LM061601	JO	4a	EU	High
KR	10270104	Lower Kansas	Clinton Lake	L	LM030001	SN, DG, OS	4a	EU	High
KR	10270104	Lower Kansas	Coal Cr Near Sibleyville	R	SC679	DG	4a	DO	Low
KR	10270104	Lower Kansas	Coal Cr Near Sibleyville	R	SC679	DG	4a	ECB	Medium
KR	10270104	Lower Kansas	Crooked Cr Near Winchester	R	SC683	JF	3	ECB	
KR	10270104	Lower Kansas	Crooked Cr Near Winchester	R	SC683	JF	5	Atr	2023
KR	10270104	Lower Kansas	Crooked Cr Near Winchester	R	SC683	JF	5	TP	2017
KR	10270104	Lower Kansas	Crooked Cr Near Winchester	R	SC683	JF	4a	Bio	Low
KR	10270104	Lower Kansas	Douglas Co. SFL	L	LM011301	DG	5	EU	2022
KR	10270104	Lower Kansas	Frisco Lake	L	LM065201	JO	4a	EU	Low
KR	10270104	Lower Kansas	Gardner City Lake	L	LM040401	JO	4a	DO	High
KR	10270104	Lower Kansas	Gardner City Lake	L	LM040401	JO	4a	EU	High
KR	10270104	Lower Kansas	Kansas R At Desoto	R	SC254	LV, JO	5	TP	2016
KR	10270104	Lower Kansas	Kansas R At Desoto	R	SC254	LV, JO	5	TSS	2023
KR	10270104	Lower Kansas	Kansas R At Desoto	R	SC254	LV, JO	4a	Bio	Medium
KR	10270104	Lower Kansas	Kansas R At Desoto	R	SC254	LV, JO	4a	Bio_Sed	Medium
KR	10270104	Lower Kansas	Kansas R At Desoto	R	SC254	LV, JO	4a	ECB	High
KR	10270104	Lower Kansas	Kansas R At Eudora	R	SC255	JF, LV, DG	5	PCB	2023
KR	10270104	Lower Kansas	Kansas R At Eudora	R	SC255	JF, LV, DG	5	TP	2016
KR	10270104	Lower Kansas	Kansas R At Eudora	R	SC255	JF, LV, DG	5	TSS	2023
KR	10270104	Lower Kansas	Kansas R At Eudora	R	SC255	JF, LV, DG	4a	Bio	Medium
KR	10270104	Lower Kansas	Kansas R At Eudora	R	SC255	JF, LV, DG	4a	ECB	High
KR	10270104	Lower Kansas	Kansas R At Kansas City, Kansas	R	SC203	LV, WY, JO	5	TP	2016

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
KR	10270104	Lower Kansas	Kansas R At Kansas City, Kansas	R	SC203	LV, WY, JO	5	TSS	2023
KR	10270104	Lower Kansas	Kansas R At Kansas City, Kansas	R	SC203	LV, WY, JO	4a	Bio	Medium
KR	10270104	Lower Kansas	Kansas R At Kansas City, Kansas	R	SC203	LV, WY, JO	4a	Bio_Sed	Medium
KR	10270104	Lower Kansas	Kansas R At Kansas City, Kansas	R	SC203	LV, WY, JO	4a	ECB	High
KR	10270104	Lower Kansas	Kansas R At Lecompton	R	SC257	JF, SN, DG	5	TP	2016
KR	10270104	Lower Kansas	Kansas R At Lecompton	R	SC257	JF, SN, DG	5	TSS	2023
KR	10270104	Lower Kansas	Kansas R At Lecompton	R	SC257	JF, SN, DG	4a	Bio	Medium
KR	10270104	Lower Kansas	Kansas R At Lecompton	R	SC257	JF, SN, DG	4a	ECB	High
KR	10270104	Lower Kansas	Kill Cr At Desoto	R	SC253	JO	3	Atr	
KR	10270104	Lower Kansas	Kill Cr At Desoto	R	SC253	JO	4a	ECB	High
KR	10270104	Lower Kansas	Lake Quivera	L	LM022701	JO	5	EU	2023
KR	10270104	Lower Kansas	Lakeview Estates Lake	L	LM075301	SN	4a	AP	Low
KR	10270104	Lower Kansas	Lakeview Estates Lake	L	LM075301	SN	4a	EU	Low
KR	10270104	Lower Kansas	Leavenworth Co. SFL	L	LM012301	LV	5	EU	2022
KR	10270104	Lower Kansas	Lenexa Lake	L	LM022601	JO	5	EU	2022
KR	10270104	Lower Kansas	Lone Star Lake	L	LM011401	DG	4a	EU	Low
KR	10270104	Lower Kansas	Mahaffie Farmstead Lake	L	LM020401	JO	5	EU	2023
KR	10270104	Lower Kansas	Mary's Lake	L	LM061401	DG	4a	DO	Medium
KR	10270104	Lower Kansas	Mary's Lake	L	LM061401	DG	4a	EU	Medium
KR	10270104	Lower Kansas	Mary's Lake	L	LM061401	DG	4a	pH	Medium
KR	10270104	Lower Kansas	Mill Cr Near Shawnee	R	SC251	JO	3	Diaz	
KR	10270104	Lower Kansas	Mill Cr Near Shawnee	R	SC251	JO	5	TP	2017
KR	10270104	Lower Kansas	Mill Cr Near Shawnee	R	SC251	JO	4a	Bio	High
KR	10270104	Lower Kansas	Mill Cr Near Shawnee	R	SC251	JO	4a	Bio_Sed	Medium
KR	10270104	Lower Kansas	Mill Cr Near Shawnee	R	SC251	JO	4a	Cl	Low
KR	10270104	Lower Kansas	Mill Cr Near Shawnee	R	SC251	JO	4a	ECB	High

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
KR	10270104	Lower Kansas	New Olathe Lake	L	LM061301	JO	4a	EU	High
KR	10270104	Lower Kansas	Nine Mile Cr Near Linwood	R	SC680	JF, LV, DG	4a	FCB	High
KR	10270104	Lower Kansas	Nine Mile Cr Near Linwood	R	SC680	JF, LV, DG	4a	Pb	Low
KR	10270104	Lower Kansas	Olathe Waterworks Lakes	L	LM062201	JO	4a	EU	Low
KR	10270104	Lower Kansas	Overbrook Lake	L	LM020501	OS	5	EU	2023
KR	10270104	Lower Kansas	Pierson Park Lake	L	LM061801	WY	4a	EU	Low
KR	10270104	Lower Kansas	Potter's Lake	L	LM073401	DG	4a	EU	Low
KR	10270104	Lower Kansas	Rose's Lake	L	LM062501	JO	5	EU	2022
KR	10270104	Lower Kansas	Stranger Cr Near Easton	R	SC602	AT, JF, LV	5	Atr	2023
KR	10270104	Lower Kansas	Stranger Cr Near Easton	R	SC602	AT, JF, LV	5	Bio	2023
KR	10270104	Lower Kansas	Stranger Cr Near Easton	R	SC602	AT, JF, LV	5	TP	2017
KR	10270104	Lower Kansas	Stranger Cr Near Easton	R	SC602	AT, JF, LV	5	TSS	2023
KR	10270104	Lower Kansas	Stranger Cr Near Easton	R	SC602	AT, JF, LV	4a	Cu	Low
KR	10270104	Lower Kansas	Stranger Cr Near Easton	R	SC602	AT, JF, LV	4a	ECB	High
KR	10270104	Lower Kansas	Stranger Cr Near Easton	R	SC602	AT, JF, LV	4a	Pb	Low
KR	10270104	Lower Kansas	Stranger Cr Near Linwood	R	SC501	LV	5	Atr	2023
KR	10270104	Lower Kansas	Stranger Cr Near Linwood	R	SC501	LV	5	Bio	2023
KR	10270104	Lower Kansas	Stranger Cr Near Linwood	R	SC501	LV	4a	ECB	High
KR	10270104	Lower Kansas	Stranger Cr Near Linwood	R	SC501	LV	4a	Pb	Low
KR	10270104	Lower Kansas	Strowbridge Reservoir	L	LM051201	OS	5	EU	2022
KR	10270104	Lower Kansas	Sunflower Park Lake	L	LM073601	JO	4a	DO	Medium
KR	10270104	Lower Kansas	Sunflower Park Lake	L	LM073601	JO	4a	EU	Medium
KR	10270104	Lower Kansas	Turkey Cr	F	NPDES55492	JO	5	NH3	2022
KR	10270104	Lower Kansas	Wakarusa R Near Eudora	R	SC500	DG	3	Bio	New
KR	10270104	Lower Kansas	Wakarusa R Near Eudora	R	SC500	DG	5	TSS	2023
KR	10270104	Lower Kansas	Wakarusa R Near Eudora	R	SC500	DG	4a	ECB	High
KR	10270104	Lower Kansas	Wakarusa R Near Topeka	R	SC109	SN, OS	4a	Bio	High
KR	10270104	Lower Kansas	Wakarusa R Near Topeka	R	SC109	SN, OS	4a	Bio_Sed	High
KR	10270104	Lower Kansas	Wakarusa R Near Topeka	R	SC109	SN, OS	4a	ECB	High

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
KR	10270104	Lower Kansas	Washington Cr Near Lawrence	R	SC678	DG	4a	DO	High
KR	10270205	Lower Big Blue	Big Blue R Near Blue Rapids	R	SC240	MS	5	Cu	2023
KR	10270205	Lower Big Blue	Big Blue R Near Blue Rapids	R	SC240	MS	5	pH	2022
KR	10270205	Lower Big Blue	Big Blue R Near Blue Rapids	R	SC240	MS	5	TP	2019
KR	10270205	Lower Big Blue	Big Blue R Near Blue Rapids	R	SC240	MS	5	TSS	2023
KR	10270205	Lower Big Blue	Big Blue R Near Blue Rapids	R	SC240	MS	4a	Atr	High
KR	10270205	Lower Big Blue	Big Blue R Near Blue Rapids	R	SC240	MS	4a	ECB	High
KR	10270205	Lower Big Blue	Big Blue R Near Oketo	R	SC233	MS	5	Ars	2023
KR	10270205	Lower Big Blue	Big Blue R Near Oketo	R	SC233	MS	5	Bio	2022
KR	10270205	Lower Big Blue	Big Blue R Near Oketo	R	SC233	MS	5	pH	2022
KR	10270205	Lower Big Blue	Big Blue R Near Oketo	R	SC233	MS	5	TP	2019
KR	10270205	Lower Big Blue	Big Blue R Near Oketo	R	SC233	MS	5	TSS	2023
KR	10270205	Lower Big Blue	Big Blue R Near Oketo	R	SC233	MS	4a	Atr	High
KR	10270205	Lower Big Blue	Big Blue R Near Oketo	R	SC233	MS	4a	ECB	High
KR	10270205	Lower Big Blue	Black Vermillion R Near Frankfort	R	SC505	MS,NM	5	Bio	2022
KR	10270205	Lower Big Blue	Black Vermillion R Near Frankfort	R	SC505	MS,NM	5	TP	2019
KR	10270205	Lower Big Blue	Black Vermillion R Near Frankfort	R	SC505	MS,NM	5	TSS	2023
KR	10270205	Lower Big Blue	Black Vermillion R Near Frankfort	R	SC505	MS,NM	4a	Atr	High
KR	10270205	Lower Big Blue	Black Vermillion R Near Frankfort	R	SC505	MS,NM	4a	ECB	High
KR	10270205	Lower Big Blue	Centralia Lake	L	LM073701	NM	3	Ars	
KR	10270205	Lower Big Blue	Centralia Lake	L	LM073701	NM	4a	AP	Medium
KR	10270205	Lower Big Blue	Centralia Lake	L	LM073701	NM	4a	EU	Medium
KR	10270205	Lower Big Blue	Centralia Lake	L	LM073701	NM	4a	pH	Medium
KR	10270205	Lower Big Blue	Fancy Cr Near Randolph	R	SC502	WS, CY, RL	5	SO4	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
KR	10270205	Lower Big Blue	Fancy Cr Near Randolph	R	SC502	WS, CY, RL	4a	Atr	High
KR	10270205	Lower Big Blue	Fancy Cr Near Randolph	R	SC502	WS, CY, RL	4a	ECB	Medium
KR	10270205	Lower Big Blue	Horseshoe Cr	R	SB475	MS	5	Bio	2022
KR	10270205	Lower Big Blue	Horseshoe Cr Near Marysville	R	SC717	MR, CS	5	SO4	2023
KR	10270205	Lower Big Blue	Horseshoe Cr Near Marysville	R	SC717	MR, CS	5	TP	2019
KR	10270205	Lower Big Blue	Horseshoe Cr Near Marysville	R	SC717	MR, CS	4a	Atr	High
KR	10270205	Lower Big Blue	Horseshoe Cr Near Marysville	R	SC717	MR, CS	4a	ECB	High
KR	10270205	Lower Big Blue	North Elm Cr Near Oketo	R	SC731	MS, NM	5	TP	2019
KR	10270205	Lower Big Blue	North Elm Cr Near Oketo	R	SC731	MS, NM	4a	Atr	High
KR	10270205	Lower Big Blue	North Fork Black Vermillion R Near Vliets	R	SC128	MS, NM	5	Bio	2022
KR	10270205	Lower Big Blue	Robidoux Cr near Frankfort	R	SC754	MS	5	TP	2019
KR	10270205	Lower Big Blue	Rocky Ford W.A.	L	LM020601	RL	3	Hg	
KR	10270205	Lower Big Blue	Spring Cr	R	SB476	MS	5	Bio	2022
KR	10270205	Lower Big Blue	Tuttle Cr Lake	L	LM021001	MS, RL, PT	4a	Ala	High
KR	10270205	Lower Big Blue	Tuttle Cr Lake	L	LM021001	MS, RL, PT	4a	Atr	High
KR	10270205	Lower Big Blue	Tuttle Cr Lake	L	LM021001	MS, RL, PT	4a	EU	High
KR	10270205	Lower Big Blue	Tuttle Cr Lake	L	LM021001	MS, RL, PT	4a	Silt	High
KR	10270207	Lower Little Blue	Lake Idlewild	L	LM061201	MS	4a	EU	Low
KR	10270207	Lower Little Blue	Little Blue R Near Hollenberg	R	SC232	RP, WS	5	Bio	2022
KR	10270207	Lower Little Blue	Little Blue R Near Hollenberg	R	SC232	RP, WS	5	Cu	2023
KR	10270207	Lower Little Blue	Little Blue R Near Hollenberg	R	SC232	RP, WS	5	pH	2022
KR	10270207	Lower Little Blue	Little Blue R Near Hollenberg	R	SC232	RP, WS	5	TP	2019
KR	10270207	Lower Little Blue	Little Blue R Near Hollenberg	R	SC232	RP, WS	5	TSS	2023
KR	10270207	Lower Little Blue	Little Blue R Near Hollenberg	R	SC232	RP, WS	4a	Atr	High
KR	10270207	Lower Little Blue	Little Blue R Near Hollenberg	R	SC232	RP, WS	4a	ECB	High

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
KR	10270207	Lower Little Blue	Little Blue R Near Waterville	R	SC741	WS, MS	5	TP	2019
KR	10270207	Lower Little Blue	Little Blue R Near Waterville	R	SC741	WS, MS	5	TSS	2023
KR	10270207	Lower Little Blue	Little Blue R Near Waterville	R	SC741	WS, MS	4a	Atr	High
KR	10270207	Lower Little Blue	Little Blue R Near Waterville	R	SC741	WS, MS	4a	ECB	High
KR	10270207	Lower Little Blue	Mill Cr Near Hanover	R	SC507	RP, WS	5	TP	2023
KR	10270207	Lower Little Blue	Mill Cr Near Hanover	R	SC507	RP, WS	5	TSS	2023
KR	10270207	Lower Little Blue	Mill Cr Near Hanover	R	SC507	RP, WS	4a	Atr	High
KR	10270207	Lower Little Blue	Mill Cr Near Hanover	R	SC507	RP, WS	4a	ECB	High
KR	10270207	Lower Little Blue	Rose Cr Near Narka	R	SC712	RP	3	ECB	
KR	10270207	Lower Little Blue	Rose Cr Near Narka	R	SC712	RP	5	Ars	2023
KR	10270207	Lower Little Blue	Rose Cr Near Narka	R	SC712	RP	5	TP	2019
KR	10270207	Lower Little Blue	Rose Cr Near Narka	R	SC712	RP	4a	Atr	High
KR	10270207	Lower Little Blue	Washington Co. SFL	L	LM010901	WS	5	EU	2023
KR	10270207	Lower Little Blue	Washington Co. SFL	L	LM010901	WS	4a	AP	Low
KR	10270207	Lower Little Blue	Washington Co. SFL	L	LM010901	WS	4a	DO	Low
KR	10270207	Lower Little Blue	Washington W.A.	L	LM010941	WS	3	DO	
KR	10270207	Lower Little Blue	Washington W.A.	L	LM010941	WS	5	Pb	2023
KR	10270207	Lower Little Blue	Washington W.A.	L	LM010941	WS	4a	EU	Low
KR	10270207	Lower Little Blue	Washington W.A.	L	LM010941	WS	4a	Silt	Low
LA	11030009	Rattlesnake	Kiowa Co. SFL	L	LM042801	KW	3	EU	
LA	11030009	Rattlesnake	Quivira Big Salt Marsh	L	LM050601	SF	4a	Cl	Low
LA	11030009	Rattlesnake	Quivira Big Salt Marsh	L	LM050601	SF	4a	EU	High
LA	11030009	Rattlesnake	Quivira Big Salt Marsh	L	LM050601	SF	4a	pH	High
LA	11030009	Rattlesnake	Quivira Big Salt Marsh	L	LM050601	SF	4a	Silt	High
LA	11030009	Rattlesnake	Quivira Little Salt Marsh	L	LM050201	SF	4a	Cl	Low
LA	11030009	Rattlesnake	Quivira Little Salt Marsh	L	LM050201	SF	4a	EU	High
LA	11030009	Rattlesnake	Quivira Little Salt Marsh	L	LM050201	SF	4a	pH	High
LA	11030009	Rattlesnake	Quivira Little Salt Marsh	L	LM050201	SF	4a	Silt	High
LA	11030010	Gar-Peace	Arkansas R Near Hutchinson	R	SC523	RC, RN	5	Se	2023
LA	11030010	Gar-Peace	Arkansas R Near Hutchinson	R	SC523	RC, RN	4a	Bio	Medium

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
LA	11030010	Gar-Peace	Arkansas R Near Hutchinson	R	SC523	RC, RN	4a	Cl	Medium
LA	11030010	Gar-Peace	Arkansas R Near Maize	R	SC536	RN, SG	4a	Bio	Medium
LA	11030010	Gar-Peace	Arkansas R Near Maize	R	SC536	RN, SG	4a	Cl	Medium
LA	11030010	Gar-Peace	Arkansas R Near Yoder	R	SC524	RN	5	Se	2023
LA	11030010	Gar-Peace	Arkansas R Near Yoder	R	SC524	RN	5	TP	2017
LA	11030010	Gar-Peace	Arkansas R Near Yoder	R	SC524	RN	4a	Bio	Medium
LA	11030010	Gar-Peace	Arkansas R Near Yoder	R	SC524	RN	4a	Cl	Medium
LA	11030010	Gar-Peace	Carey Park Lake	L	LM063001	RN	4a	EU	Low
LA	11030010	Gar-Peace	Peace Cr Near Sterling	R	SC658	SF, RN, PR	4a	Cl	Low
LA	11030010	Gar-Peace	Peace Cr Near Sterling	R	SC658	SF, RN, PR	4a	ECB	Medium
LA	11030010	Gar-Peace	Peace Cr Near Sterling	R	SC658	SF, RN, PR	4a	pH	Medium
LA	11030010	Gar-Peace	Salt Cr Near Hutchinson	R	SC659	RN	5	ECB	2023
LA	11030010	Gar-Peace	Salt Cr Near Hutchinson	R	SC659	RN	4a	Cl	Medium
LA	11030010	Gar-Peace	Salt Cr Near Hutchinson	R	SC659	RN	4a	pH	Medium
LA	11030011	Cow Cr	Barton Lake	L	LM072701	BT	5	EU	2023
LA	11030011	Cow Cr	Cheyenne Bottoms	L	LM050401	BT	5	Silt	2023
LA	11030011	Cow Cr	Cheyenne Bottoms	L	LM050401	BT	4a	DO	High
LA	11030011	Cow Cr	Cheyenne Bottoms	L	LM050401	BT	4a	EU	High
LA	11030011	Cow Cr	Cow Cr Near Hutchinson	R	SC287	RN	5	PCB	2023
LA	11030011	Cow Cr	Cow Cr Near Hutchinson	R	SC287	RN	5	Se	2023
LA	11030011	Cow Cr	Cow Cr Near Hutchinson	R	SC287	RN	4a	Bio	Medium
LA	11030011	Cow Cr	Cow Cr Near Hutchinson	R	SC287	RN	4a	Cl	Medium
LA	11030011	Cow Cr	Cow Cr Near Hutchinson	R	SC287	RN	4a	ECB	High
LA	11030011	Cow Cr	Cow Cr Near Lyons	R	SC657	EW, BT, RC	5	Ars	2023
LA	11030011	Cow Cr	Cow Cr Near Lyons	R	SC657	EW, BT, RC	5	TP	2023
LA	11030011	Cow Cr	Cow Cr Near Lyons	R	SC657	EW, BT, RC	5	TSS	2023
LA	11030011	Cow Cr	Cow Cr Near Lyons	R	SC657	EW, BT, RC	4a	Cl	Medium
LA	11030011	Cow Cr	Cow Cr Near Lyons	R	SC657	EW, BT, RC	4a	FCB	High
LA	11030011	Cow Cr	Cow Cr Near Willowbrook	R	SC522	RC, RN	3	Atr	New
LA	11030011	Cow Cr	Cow Cr Near Willowbrook	R	SC522	RC, RN	5	Ars	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
LA	11030011	Cow Cr	Cow Cr Near Willowbrook	R	SC522	RC, RN	5	Se	2023
LA	11030011	Cow Cr	Cow Cr Near Willowbrook	R	SC522	RC, RN	5	TP	2023
LA	11030011	Cow Cr	Cow Cr Near Willowbrook	R	SC522	RC, RN	5	TSS	2023
LA	11030011	Cow Cr	Cow Cr Near Willowbrook	R	SC522	RC, RN	4a	Cl	Medium
LA	11030011	Cow Cr	Cow Cr Near Willowbrook	R	SC522	RC, RN	4a	ECB	High
LA	11030011	Cow Cr	Little Cow Cr Near Lyons	R	SC656	EW, RC	3	Diaz	
LA	11030011	Cow Cr	Little Cow Cr Near Lyons	R	SC656	EW, RC	5	TP	2023
LA	11030011	Cow Cr	Little Cow Cr Near Lyons	R	SC656	EW, RC	4a	Cl	Medium
LA	11030011	Cow Cr	Little Cow Cr Near Lyons	R	SC656	EW, RC	4a	DO	High
LA	11030011	Cow Cr	Little Cow Cr Near Lyons	R	SC656	EW, RC	4a	ECB	High
LA	11030011	Cow Cr	Little Cow Cr Near Lyons	R	SC656	EW, RC	4a	NO23	High
LA	11030011	Cow Cr	Sterling City Lake	L	LM064801	RC	5	EU	2023
LA	11030012	Little Arkansas	Black Kettle Cr Near Halstead	R	SC705	MP, HV	5	Ars	2023
LA	11030012	Little Arkansas	Black Kettle Cr Near Halstead	R	SC705	MP, HV	5	Atr	2023
LA	11030012	Little Arkansas	Black Kettle Cr Near Halstead	R	SC705	MP, HV	5	Cu	2023
LA	11030012	Little Arkansas	Black Kettle Cr Near Halstead	R	SC705	MP, HV	5	DO	2022
LA	11030012	Little Arkansas	Black Kettle Cr Near Halstead	R	SC705	MP, HV	5	TP	2020
LA	11030012	Little Arkansas	Black Kettle Cr Near Halstead	R	SC705	MP, HV	4a	Bio	High
LA	11030012	Little Arkansas	Black Kettle Cr Near Halstead	R	SC705	MP, HV	4a	Bio_Sed	High
LA	11030012	Little Arkansas	Black Kettle Cr Near Halstead	R	SC705	MP, HV	4a	TSS	High
LA	11030012	Little Arkansas	Buhler City Lake	L	LM050701	RN	5	EU	2023
LA	11030012	Little Arkansas	Dillon Park Lakes	L	LM063101	RN	4a	EU	Medium

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
LA	11030012	Little Arkansas	Dillon Park Lakes	L	LM063101	RN	4a	pH	Medium
LA	11030012	Little Arkansas	Emma Cr Near Sedgwick	R	SC534	MP, MN, HV	5	Ars	2023
LA	11030012	Little Arkansas	Emma Cr Near Sedgwick	R	SC534	MP, MN, HV	5	DO	2022
LA	11030012	Little Arkansas	Emma Cr Near Sedgwick	R	SC534	MP, MN, HV	5	TP	2020
LA	11030012	Little Arkansas	Emma Cr Near Sedgwick	R	SC534	MP, MN, HV	4a	Bio	High
LA	11030012	Little Arkansas	Emma Cr Near Sedgwick	R	SC534	MP, MN, HV	4a	Bio_Sed	High
LA	11030012	Little Arkansas	Emma Cr Near Sedgwick	R	SC534	MP, MN, HV	4a	ECB	High
LA	11030012	Little Arkansas	Emma Cr Near Sedgwick	R	SC534	MP, MN, HV	4b	Atr	Low
LA	11030012	Little Arkansas	Harvey Co. Camp Hawk Lake	L	LM063401	HV	4a	EU	Low
LA	11030012	Little Arkansas	Harvey Co. Camp Hawk Lake	L	LM063401	HV	4a	Silt	Low
LA	11030012	Little Arkansas	Harvey Co. West Park Lake	L	LM049001	HV	3	DO	
LA	11030012	Little Arkansas	Harvey Co. West Park Lake	L	LM049001	HV	4a	EU	Low
LA	11030012	Little Arkansas	Inman Lake	L	LM050301	MP	3	Cu	
LA	11030012	Little Arkansas	Inman Lake	L	LM050301	MP	3	Pb	
LA	11030012	Little Arkansas	Inman Lake	L	LM050301	MP	3	Silt	
LA	11030012	Little Arkansas	Kisiwa Cr Near Halstead	R	SC703	HV, RN	5	Atr	2023
LA	11030012	Little Arkansas	Kisiwa Cr Near Halstead	R	SC703	HV, RN	5	DO	2022
LA	11030012	Little Arkansas	Kisiwa Cr Near Halstead	R	SC703	HV, RN	5	TP	2020
LA	11030012	Little Arkansas	Kisiwa Cr Near Halstead	R	SC703	HV, RN	4a	Bio	High
LA	11030012	Little Arkansas	Kisiwa Cr Near Halstead	R	SC703	HV, RN	4a	Bio_Sed	High
LA	11030012	Little Arkansas	Kisiwa Cr Near Halstead	R	SC703	HV, RN	4a	TSS	High
LA	11030012	Little Arkansas	Little Arkansas R At Alta Mills	R	SC246	MP, RC, RN	5	Ars	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
LA	11030012	Little Arkansas	Little Arkansas R At Alta Mills	R	SC246	MP, RC, RN	5	Atr	2023
LA	11030012	Little Arkansas	Little Arkansas R At Alta Mills	R	SC246	MP, RC, RN	5	Se	2023
LA	11030012	Little Arkansas	Little Arkansas R At Alta Mills	R	SC246	MP, RC, RN	5	TP	2020
LA	11030012	Little Arkansas	Little Arkansas R At Alta Mills	R	SC246	MP, RC, RN	4a	Bio	High
LA	11030012	Little Arkansas	Little Arkansas R At Alta Mills	R	SC246	MP, RC, RN	4a	Bio_Sed	High
LA	11030012	Little Arkansas	Little Arkansas R At Alta Mills	R	SC246	MP, RC, RN	4a	Cl	Medium
LA	11030012	Little Arkansas	Little Arkansas R At Alta Mills	R	SC246	MP, RC, RN	4a	ECB	High
LA	11030012	Little Arkansas	Little Arkansas R At Alta Mills	R	SC246	MP, RC, RN	4a	TSS	High
LA	11030012	Little Arkansas	Little Arkansas R At Valley Center	R	SC282	HV, SG	5	Atr	2023
LA	11030012	Little Arkansas	Little Arkansas R At Valley Center	R	SC282	HV, SG	5	TP	2020
LA	11030012	Little Arkansas	Little Arkansas R At Valley Center	R	SC282	HV, SG	4a	Bio	High
LA	11030012	Little Arkansas	Little Arkansas R At Valley Center	R	SC282	HV, SG	4a	Bio_Sed	High
LA	11030012	Little Arkansas	Little Arkansas R At Valley Center	R	SC282	HV, SG	4a	ECB	High
LA	11030012	Little Arkansas	Little Arkansas R At Valley Center	R	SC282	HV, SG	4a	TSS	High
LA	11030012	Little Arkansas	Little Arkansas R At Wichita	R	SC728	SG, SU	5	Atr	2023
LA	11030012	Little Arkansas	Little Arkansas R At Wichita	R	SC728	SG, SU	5	Hg	2023
LA	11030012	Little Arkansas	Little Arkansas R At Wichita	R	SC728	SG, SU	5	PCB	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
LA	11030012	Little Arkansas	Little Arkansas R At Wichita	R	SC728	SG, SU	5	TP	2017
LA	11030012	Little Arkansas	Little Arkansas R At Wichita	R	SC728	SG, SU	4a	Bio	High
LA	11030012	Little Arkansas	Little Arkansas R At Wichita	R	SC728	SG, SU	4a	Bio_Sed	High
LA	11030012	Little Arkansas	Little Arkansas R At Wichita	R	SC728	SG, SU	4a	ECB	High
LA	11030012	Little Arkansas	Little Arkansas R At Wichita	R	SC728	SG, SU	4a	TSS	High
LA	11030012	Little Arkansas	Mingenback Lake	L	LM064701	MP	3	Silt	
LA	11030012	Little Arkansas	Mingenback Lake	L	LM064701	MP	4a	DO	Medium
LA	11030012	Little Arkansas	Mingenback Lake	L	LM064701	MP	4a	EU	Medium
LA	11030012	Little Arkansas	Newton City Park Lake	L	LM064201	HV	4a	EU	High
LA	11030012	Little Arkansas	Sand Cr Near Sedgwick	R	SC535	MN, HV	4a	Bio	High
LA	11030012	Little Arkansas	Sand Cr Near Sedgwick	R	SC535	MN, HV	4a	Bio_Sed	High
LA	11030012	Little Arkansas	Sand Cr Near Sedgwick	R	SC535	MN, HV	4a	DO	Medium
LA	11030012	Little Arkansas	Sand Cr Near Sedgwick	R	SC535	MN, HV	4a	ECB	High
LA	11030012	Little Arkansas	Sand Cr Near Sedgwick	R	SC535	MN, HV	4a	NO23	High
LA	11030012	Little Arkansas	Sand Cr Near Sedgwick	R	SC535	MN, HV	4a	TP	High
LA	11030012	Little Arkansas	Sand Cr Near Sedgwick	R	SC535	MN, HV	4b	Atr	Low
LA	11030012	Little Arkansas	Turkey Cr Near Alta Mills	R	SC533	MP, RC, RN	5	Ars	2023
LA	11030012	Little Arkansas	Turkey Cr Near Alta Mills	R	SC533	MP, RC, RN	5	Se	2023
LA	11030012	Little Arkansas	Turkey Cr Near Alta Mills	R	SC533	MP, RC, RN	4a	Bio	High
LA	11030012	Little Arkansas	Turkey Cr Near Alta Mills	R	SC533	MP, RC, RN	4a	Bio_Sed	High
LA	11030012	Little Arkansas	Turkey Cr Near Alta Mills	R	SC533	MP, RC, RN	4a	Cl	Medium
LA	11030012	Little Arkansas	Turkey Cr Near Alta Mills	R	SC533	MP, RC, RN	4a	DO	High
LA	11030012	Little Arkansas	Turkey Cr Near Alta Mills	R	SC533	MP, RC, RN	4a	ECB	High

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
LA	11030012	Little Arkansas	Turkey Cr Near Alta Mills	R	SC533	MP, RC, RN	4a	TP	High
LA	11030012	Little Arkansas	Turkey Cr Near Alta Mills	R	SC533	MP, RC, RN	4a	TSS	High
LA	11030012	Little Arkansas	Turkey Cr Near Alta Mills	R	SC533	MP, RC, RN	4b	Atr	Low
LA	11030013	Middle Arkansas-Slate	Arkansas R At Derby	R	SC281	SG	5	NO23	2017
LA	11030013	Middle Arkansas-Slate	Arkansas R At Derby	R	SC281	SG	5	PCB	2023
LA	11030013	Middle Arkansas-Slate	Arkansas R At Derby	R	SC281	SG	5	TP	2017
LA	11030013	Middle Arkansas-Slate	Arkansas R At Derby	R	SC281	SG	4a	Bio	Medium
LA	11030013	Middle Arkansas-Slate	Arkansas R At Derby	R	SC281	SG	4a	Cl	Medium
LA	11030013	Middle Arkansas-Slate	Arkansas R At Derby	R	SC281	SG	4a	ECB	High
LA	11030013	Middle Arkansas-Slate	Arkansas R At Oxford	R	SC527	SG, SU, CL	5	pH	2022
LA	11030013	Middle Arkansas-Slate	Arkansas R At Oxford	R	SC527	SG, SU, CL	5	TP	2017
LA	11030013	Middle Arkansas-Slate	Arkansas R At Oxford	R	SC527	SG, SU, CL	5	TSS	2023
LA	11030013	Middle Arkansas-Slate	Arkansas R At Oxford	R	SC527	SG, SU, CL	4a	Cl	Medium
LA	11030013	Middle Arkansas-Slate	Arkansas R At Oxford	R	SC527	SG, SU, CL	4a	ECB	High
LA	11030013	Middle Arkansas-Slate	Arkansas R At Wichita	R	SC729	SG, SU	5	TP	2017

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
LA	11030013	Middle Arkansas-Slate	Arkansas R At Wichita	R	SC729	SG, SU	4a	Bio	Low
LA	11030013	Middle Arkansas-Slate	Arkansas R At Wichita	R	SC729	SG, SU	4a	Cl	Medium
LA	11030013	Middle Arkansas-Slate	Arkansas R At Wichita	R	SC729	SG, SU	4a	ECB	High
LA	11030013	Middle Arkansas-Slate	Arkansas R Near Arkansas City	R	SC218	SU, CL	3	ECB	
LA	11030013	Middle Arkansas-Slate	Arkansas R Near Arkansas City	R	SC218	SU, CL	5	pH	2022
LA	11030013	Middle Arkansas-Slate	Arkansas R Near Arkansas City	R	SC218	SU, CL	5	TP	2017
LA	11030013	Middle Arkansas-Slate	Arkansas R Near Arkansas City	R	SC218	SU, CL	5	TSS	2023
LA	11030013	Middle Arkansas-Slate	Arkansas R Near Arkansas City	R	SC218	SU, CL	4a	Bio	Medium
LA	11030013	Middle Arkansas-Slate	Arkansas R Near Arkansas City	R	SC218	SU, CL	4a	Cl	Medium
LA	11030013	Middle Arkansas-Slate	Cadillac Lake (Pracht Wetland)	L	LM054101	SG	4a	EU	Low
LA	11030013	Middle Arkansas-Slate	Chisholm Cr Park Lake	L	LM064601	SG	5	EU	2023
LA	11030013	Middle Arkansas-Slate	Colwich City Lake	L	LM017501	SG	5	EU	2023
LA	11030013	Middle Arkansas-Slate	Cowskin Cr At Wichita	R	SC730	SG, SU	5	TP	2020
LA	11030013	Middle Arkansas-Slate	Cowskin Cr At Wichita	R	SC730	SG, SU	4a	Bio	High
LA	11030013	Middle Arkansas-Slate	Cowskin Cr At Wichita	R	SC730	SG, SU	4a	ECB	High

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
LA	11030013	Middle Arkansas-Slate	Cowskin Cr In Wichita-Valley Center Floodway	R	SC288	SG	5	TP	2020
LA	11030013	Middle Arkansas-Slate	Cowskin Cr In Wichita-Valley Center Floodway	R	SC288	SG	4a	Bio	High
LA	11030013	Middle Arkansas-Slate	Cowskin Cr In Wichita-Valley Center Floodway	R	SC288	SG	4a	ECB	High
LA	11030013	Middle Arkansas-Slate	Cowskin Cr Near Belle Plaine	R	SC702	SG, SU	5	ECB	2023
LA	11030013	Middle Arkansas-Slate	Cowskin Cr Near Belle Plaine	R	SC702	SG, SU	5	TP	2020
LA	11030013	Middle Arkansas-Slate	Cowskin Cr Near Belle Plaine	R	SC702	SG, SU	5	TSS	2023
LA	11030013	Middle Arkansas-Slate	Eagle Lake (Belaire Lake)	L	LM022101	SG	5	EU	2023
LA	11030013	Middle Arkansas-Slate	Emery Park Lake	L	LM063201	SG	5	EU	2023
LA	11030013	Middle Arkansas-Slate	Hargis Lake	L	LM039901	SU	5	EU	2023
LA	11030013	Middle Arkansas-Slate	Harrison Park Lake	L	LM022301	SG	5	EU	2023
LA	11030013	Middle Arkansas-Slate	Horseshoe Lake	L	LM063501	SG	4a	EU	Low
LA	11030013	Middle Arkansas-Slate	Kid's Lake	L	LM063601	SG	4a	EU	Low
LA	11030013	Middle Arkansas-Slate	Moss Lake	L	LM064101	SG	5	EU	2023
LA	11030013	Middle Arkansas-Slate	Riggs Park Lake	L	LM022401	SG	5	EU	2023
LA	11030013	Middle Arkansas-Slate	Slate Cr Near Wellington	R	SC528	SU	3	Bio	New

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
LA	11030013	Middle Arkansas-Slate	Slate Cr Near Wellington	R	SC528	SU	5	Ars	2023
LA	11030013	Middle Arkansas-Slate	Slate Cr Near Wellington	R	SC528	SU	5	Atr	2023
LA	11030013	Middle Arkansas-Slate	Slate Cr Near Wellington	R	SC528	SU	5	TP	2020
LA	11030013	Middle Arkansas-Slate	Slate Cr Near Wellington	R	SC528	SU	5	TSS	2023
LA	11030013	Middle Arkansas-Slate	Slate Cr Near Wellington	R	SC528	SU	4a	ECB	High
LA	11030013	Middle Arkansas-Slate	Slate Cr Near Wellington	R	SC528	SU	4a	SO4	Low
LA	11030013	Middle Arkansas-Slate	Slate Cr W.A.	L	LM014201	SU	4a	Cl	Medium
LA	11030013	Middle Arkansas-Slate	Slate Cr W.A.	L	LM014201	SU	4a	EU	Medium
LA	11030013	Middle Arkansas-Slate	Slate Cr W.A.	L	LM014201	SU	4a	pH	Medium
LA	11030013	Middle Arkansas-Slate	Slate Cr W.A.	L	LM014201	SU	4a	Silt	Medium
LA	11030013	Middle Arkansas-Slate	Slate Cr W.A.	L	LM014201	SU	4a	SO4	Low
LA	11030013	Middle Arkansas-Slate	Vic's Lake	L	LM064301	SG	3	EU	
LA	11030013	Middle Arkansas-Slate	Watson Park Lake	L	LM064401	SG	4a	EU	Low
LA	11030013	Middle Arkansas-Slate	Windmill Lake	L	LM064501	SG	3	EU	
LA	11030014	North Fork Ninnescah	Cheney Lake	L	LM017001	RN	3	pH	

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
LA	11030014	North Fork Ninnescah	Cheney Lake	L	LM017001	RN	4a	EU	High
LA	11030014	North Fork Ninnescah	Cheney Lake	L	LM017001	RN	4a	Silt	High
LA	11030014	North Fork Ninnescah	North Fork Ninnescah R Near Castleton	R	SC525	SF, RN, PR	4a	pH	Low
LA	11030015	South Fork Ninnescah	Kingman Co. SFL	L	LM010401	KM	5	EU	2023
LA	11030015	South Fork Ninnescah	Kingman Co. SFL	L	LM010401	KM	4a	AP	Medium
LA	11030015	South Fork Ninnescah	Kingman Co. SFL	L	LM010401	KM	4a	DO	Medium
LA	11030015	South Fork Ninnescah	Kingman Co. SFL	L	LM010401	KM	4a	pH	Medium
LA	11030015	South Fork Ninnescah	Lemon Park Lake	L	LM063901	PR	3	EU	
LA	11030015	South Fork Ninnescah	Pratt Co. Lake	L	LM064001	PR	5	pH	2023
LA	11030015	South Fork Ninnescah	Pratt Co. Lake	L	LM064001	PR	4a	EU	High
LA	11030015	South Fork Ninnescah	South Fork Ninnescah R Near Murdock	R	SC036	PR, KM	5	Temp	2023
LA	11030015	South Fork Ninnescah	South Fork Ninnescah R Near Murdock	R	SC036	PR, KM	4a	Cl	Medium
LA	11030015	South Fork Ninnescah	Texas Lake W.A.	L	LM053001	PR	5	DO	2023
LA	11030016	Ninnescah	Lake Afton	L	LM049201	SG	4a	EU	High
LA	11030016	Ninnescah	Ninnescah R Near Belle Plaine	R	SC280	SG, KM, SU	3	Bio_Sed	
LA	11030016	Ninnescah	Ninnescah R Near Belle Plaine	R	SC280	SG, KM, SU	3	ECB	

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
LA	11030016	Ninnescah	Ninnescah R Near Belle Plaine	R	SC280	SG, KM, SU	4a	Cl	Medium
LA	11060001	Kaw Lake	Beaver Cr Near Maple City	R	SC664	CL	3	ECB	
LA	11060001	Kaw Lake	Cowley Co. SFL	L	LM013401	CL	5	EU	2023
LA	11060001	Kaw Lake	Cowley Co. SFL	L	LM013401	CL	4a	Se	Low
LA	11060001	Kaw Lake	Grouse Cr Near Cambridge	R	SC761	CL	3	Bio	
LA	11060001	Kaw Lake	Grouse Cr Near Silverdale	R	SC531	CL	3	Bio	New
LA	11060001	Kaw Lake	Grouse Cr Near Silverdale	R	SC531	CL	3	ECB	
LA	11060001	Kaw Lake	Silver Cr Near Silverdale	R	SC706	CL	4a	DO	Medium
LA	11060002	Upper Salt Fork Arkansas	Mule Cr Near Aetna	R	SC622	KW, BA, CM	4a	FCB	Medium
LA	11060002	Upper Salt Fork Arkansas	Salt Fork Arkansas R Near Hardtner	R	SC591	BA, CM	5	Temp	2023
LA	11060002	Upper Salt Fork Arkansas	Salt Fork Arkansas R Near Hardtner	R	SC591	BA, CM	4a	Cl	Low
LA	11060003	Medicine Lodge	Barber Co. SFL	L	LM013101	BA	5	SO4	2023
LA	11060003	Medicine Lodge	Barber Co. SFL	L	LM013101	BA	4a	DO	Low
LA	11060003	Medicine Lodge	Elm Cr Near Medicine Lodge	R	SC590	PR, BA	3	ECB	
LA	11060003	Medicine Lodge	Medicine Lodge R Near Belvidere	R	SC588	KW	4a	FCB	High
LA	11060003	Medicine Lodge	Medicine Lodge R Near Medicine Lodge	R	SC589	PR, KW, BA	4a	FCB	High
LA	11060003	Medicine Lodge	Medicine Lodge R Near Medicine Lodge	R	SC589	PR, KW, BA	4a	SO4	Low
LA	11060004	Lower Salt Fork Arkansas	Sandy Cr Near Ruella	R	SC619	HP	5	Temp	2023
LA	11060005	Chikaskia	Anthony City Lake	L	LM048801	HP	4a	DO	High
LA	11060005	Chikaskia	Anthony City Lake	L	LM048801	HP	4a	EU	High
LA	11060005	Chikaskia	Anthony City Lake	L	LM048801	HP	4a	pH	High
LA	11060005	Chikaskia	Anthony City Lake	L	LM048801	HP	4a	Silt	High

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
LA	11060005	Chikaskia	Bluff Cr Near Bluff City	R	SC618	HP	5	TP	2023
LA	11060005	Chikaskia	Bluff Cr Near Bluff City	R	SC618	HP	4a	ECB	High
LA	11060005	Chikaskia	Bluff Cr Near Bluff City	R	SC618	HP	4a	Se	Medium
LA	11060005	Chikaskia	Bluff Cr Near Caldwell	R	SC530	HP	5	Ars	2023
LA	11060005	Chikaskia	Bluff Cr Near Caldwell	R	SC530	HP	4a	ECB	High
LA	11060005	Chikaskia	Chikaskia R Near Corbin	R	SC529	SU	4a	ECB	High
LA	11060005	Chikaskia	Fall Cr Near Caldwell	R	SC662	SU	5	Ars	2023
LA	11060005	Chikaskia	Fall Cr Near Caldwell	R	SC662	SU	4a	FCB	High
LA	11060005	Chikaskia	Isabel W.A.	L	LM014301	PR	5	Cu	2023
LA	11060005	Chikaskia	Isabel W.A.	L	LM014301	PR	5	DO	2023
LA	11060005	Chikaskia	Isabel W.A.	L	LM014301	PR	4a	EU	Low
LA	11060005	Chikaskia	Isabel W.A.	L	LM014301	PR	4a	pH	Low
LA	11060005	Chikaskia	Shoofly Cr Near Hunnewell	R	SC663	SU	3	ECB	
LA	11060005	Chikaskia	Shoofly Cr Near Hunnewell	R	SC663	SU	5	TP	2023
LA	11060005	Chikaskia	Wellington Lake	L	LM042201	SU	4a	Se	Low
LA	11060005	Chikaskia	Wellington Lake	L	LM042201	SU	4a	Silt	Medium
MC	10290101	Upper Marais Des Cygnes	110 Mile Cr Near Scranton	R	SC633	OS, FR	5	Atr	2023
MC	10290101	Upper Marais Des Cygnes	110 Mile Cr Near Scranton	R	SC633	OS, FR	4a	DO	High
MC	10290101	Upper Marais Des Cygnes	Appanoose Cr Near Richter	R	SC692	DG, OS, FR	5	DO	2022
MC	10290101	Upper Marais Des Cygnes	Appanoose Cr Near Richter	R	SC692	DG, OS, FR	5	Pb	2023
MC	10290101	Upper Marais Des Cygnes	Cedar Cr Lake	L	LM040701	AN	4a	EU	High
MC	10290101	Upper Marais Des Cygnes	Cedar Cr Lake	L	LM040701	AN	4a	Silt	High
MC	10290101	Upper Marais Des Cygnes	Crystal Lake	L	LM064901	AN	4a	EU	Medium

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
MC	10290101	Upper Marais Des Cygnes	Dragoon Cr Near Burlingame	R	SC577	WB, OS	3	ECB	
MC	10290101	Upper Marais Des Cygnes	Dragoon Cr Near Burlingame	R	SC577	WB, OS	5	Atr	2023
MC	10290101	Upper Marais Des Cygnes	Garnett North Lake	L	LM040601	AN	5	EU	2022
MC	10290101	Upper Marais Des Cygnes	Lebo City Lake	L	LM041201	CF	3	Cu	
MC	10290101	Upper Marais Des Cygnes	Lebo City Park Lake	L	LM065601	CF	4a	EU	Low
MC	10290101	Upper Marais Des Cygnes	Marais Des Cygnes R Near Ottawa	R	SC270	DG, FR	4a	ECB	High
MC	10290101	Upper Marais Des Cygnes	Marais Des Cygnes R Near Quenemo	R	SC720	OS, CF	3	ECB	
MC	10290101	Upper Marais Des Cygnes	Marais Des Cygnes R Near Reading	R	SC742	WB, LY	4a	ECB	High
MC	10290101	Upper Marais Des Cygnes	Marais Des Cygnes R Near Richter	R	SC555	OS, FR	3	ECB	
MC	10290101	Upper Marais Des Cygnes	One Hundred Forty Two Mile Cr Near Reading	R	SC579	LY	4a	DO	High
MC	10290101	Upper Marais Des Cygnes	One Hundred Forty Two Mile Cr Near Reading	R	SC579	LY	4a	FCB	High
MC	10290101	Upper Marais Des Cygnes	Osage City Reservoir	L	LM066101	OS	4a	EU	Low
MC	10290101	Upper Marais Des Cygnes	Osawatomie City Lake	L	LM066201	MI	5	EU	2023
MC	10290101	Upper Marais Des Cygnes	Ottawa Cr Near Ottawa	R	SC616	DG, FR	3	ECB	
MC	10290101	Upper Marais Des Cygnes	Ottawa Cr Near Ottawa	R	SC616	DG, FR	4a	DO	High

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
MC	10290101	Upper Marais Des Cygnes	Ottawa Cr Near Ottawa	R	SC616	DG, FR	4a	Pb	Low
MC	10290101	Upper Marais Des Cygnes	Pomona Lake	L	LM028001	OS	4a	EU	High
MC	10290101	Upper Marais Des Cygnes	Pomona Lake	L	LM028001	OS	4a	Silt	High
MC	10290101	Upper Marais Des Cygnes	Pottawatomie Cr Near Osawatomie	R	SC556	FR, AN	3	ECB	
MC	10290101	Upper Marais Des Cygnes	Pottawatomie Cr Near Osawatomie	R	SC556	FR, AN	5	Bio	2022
MC	10290101	Upper Marais Des Cygnes	Pottawatomie Cr Near Osawatomie	R	SC556	FR, AN	4a	DO	High
MC	10290101	Upper Marais Des Cygnes	Richmond City Lake	L	LM046801	FR	5	DO	2022
MC	10290101	Upper Marais Des Cygnes	Richmond City Lake	L	LM046801	FR	5	EU	2022
MC	10290101	Upper Marais Des Cygnes	Salt Cr	F	NPDES24821	OS	5	ECB	2023
MC	10290101	Upper Marais Des Cygnes	Salt Cr Near Lyndon	R	SC578	OS, FR	5	ECB	2023
MC	10290101	Upper Marais Des Cygnes	Salt Cr Near Lyndon	R	SC578	OS, FR	4a	Atr	Low
MC	10290101	Upper Marais Des Cygnes	Salt Cr Near Lyndon	R	SC578	OS, FR	4a	DO	Low
MC	10290101	Upper Marais Des Cygnes	Spring Cr Park Lake	L	LM066801	DG	4a	AP	Low
MC	10290101	Upper Marais Des Cygnes	Spring Cr Park Lake	L	LM066801	DG	4a	EU	Low
MC	10290101	Upper Marais Des Cygnes	Switzler Cr Near Burlingame	R	SC687	OS	5	Atr	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
MC	10290101	Upper Marais Des Cygnes	Switzler Cr Near Burlingame	R	SC687	OS	4a	DO	High
MC	10290101	Upper Marais Des Cygnes	Westphalia Lake	L	LM066901	AN	5	Silt	2023
MC	10290102	Lower Marais Des Cygnes	Big Sugar Cr Near Trading Post	R	SC558	AN, LN	3	ECB	
MC	10290102	Lower Marais Des Cygnes	Big Sugar Cr Near Trading Post	R	SC558	AN, LN	4a	DO	Medium
MC	10290102	Lower Marais Des Cygnes	Bull Cr Near Henson	R	SC557	MI	5	ECB	2023
MC	10290102	Lower Marais Des Cygnes	Critzer Lake	L	LM051301	LN	5	EU	2023
MC	10290102	Lower Marais Des Cygnes	Edgerton City Lake	L	LM065001	JO	4a	Atr	Medium
MC	10290102	Lower Marais Des Cygnes	Edgerton City Lake	L	LM065001	JO	4a	EU	Medium
MC	10290102	Lower Marais Des Cygnes	Hillsdale Lake	L	LM035001	JO, MI	4a	EU	High
MC	10290102	Lower Marais Des Cygnes	La Cygne Lake	L	LM044002	MI, LN	3	EU	
MC	10290102	Lower Marais Des Cygnes	Louisburg SFL	L	LM043801	MI	4a	EU	High
MC	10290102	Lower Marais Des Cygnes	Marais Des Cygnes Near Trading Post	R	SC206	MI, LN	3	ECB	
MC	10290102	Lower Marais Des Cygnes	Marais Des Cygnes Near Trading Post	R	SC745	LN	3	Bio	
MC	10290102	Lower Marais Des Cygnes	Marais Des Cygnes Near Trading Post	R	SC745	LN	3	ECB	
MC	10290102	Lower Marais Des Cygnes	Marais Des Cygnes Near Trading Post	R	SC745	LN	5	TSS	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
MC	10290102	Lower Marais Des Cygnes	Marais Des Cygnes R Near Henson	R	SC743	FR, MI	5	Atr	2023
MC	10290102	Lower Marais Des Cygnes	Marais Des Cygnes W.A.	L	LM053201	LN	3	Atr	
MC	10290102	Lower Marais Des Cygnes	Marais Des Cygnes W.A.	L	LM053201	LN	5	Ars	2023
MC	10290102	Lower Marais Des Cygnes	Marais Des Cygnes W.A.	L	LM053201	LN	5	Cu	2023
MC	10290102	Lower Marais Des Cygnes	Marais Des Cygnes W.A.	L	LM053201	LN	5	Pb	2023
MC	10290102	Lower Marais Des Cygnes	Marais Des Cygnes W.A.	L	LM053201	LN	4a	DO	High
MC	10290102	Lower Marais Des Cygnes	Marais Des Cygnes W.A.	L	LM053201	LN	4a	EU	High
MC	10290102	Lower Marais Des Cygnes	Marais Des Cygnes W.A.	L	LM053201	LN	4a	pH	High
MC	10290102	Lower Marais Des Cygnes	Marais Des Cygnes W.A.	L	LM053201	LN	4a	Silt	High
MC	10290102	Lower Marais Des Cygnes	Miami Co. SFL	L	LM043601	MI	4a	EU	Medium
MC	10290102	Lower Marais Des Cygnes	Miami Co. SFL	L	LM043601	MI	4a	pH	Medium
MC	10290102	Lower Marais Des Cygnes	Middle Cr Near New Lancaster	R	SC697	MI	3	ECB	New 3
MC	10290102	Lower Marais Des Cygnes	Middle Cr Near New Lancaster	R	SC697	MI	4a	DO	High
MC	10290102	Lower Marais Des Cygnes	Miola Lake	L	LM051001	MI	5	EU	2023
MC	10290102	Lower Marais Des Cygnes	Mound City Lake	L	LM051401	LN	4a	AP	Medium

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
MC	10290102	Lower Marais Des Cygnes	Mound City Lake	L	LM051401	LN	4a	DO	Medium
MC	10290102	Lower Marais Des Cygnes	Mound City Lake	L	LM051401	LN	4a	EU	Medium
MC	10290102	Lower Marais Des Cygnes	Mound City Lake	L	LM051401	LN	4a	pH	Medium
MC	10290102	Lower Marais Des Cygnes	Paola City Lake	L	LM073201	MI	3	EU	
MC	10290102	Lower Marais Des Cygnes	Pleasanton Lake #1	L	LM066401	LN	5	EU	2023
MC	10290102	Lower Marais Des Cygnes	Pleasanton Lake #2	L	LM066501	LN	5	EU	2023
MC	10290102	Lower Marais Des Cygnes	Pleasanton Reservoir	L	LM044201	LN	4a	EU	High
MC	10290102	Lower Marais Des Cygnes	Spring Hill City Lake	L	LM073501	JO	5	EU	2023
MC	10290103	Little Osage	Little Osage R Near Fulton	R	SC207	AN, LN, AL, BB	5	Bio	2023
MC	10290103	Little Osage	Little Osage R Near Fulton	R	SC207	AN, LN, AL, BB	5	DO	2023
MC	10290103	Little Osage	Little Osage R Near Fulton	R	SC207	AN, LN, AL, BB	4a	ECB	Medium
MC	10290103	Little Osage	Prescott City Lake	L	LM066601	LN	4a	EU	Low
MC	10290104	Marmaton	Bourbon Co. SFL	L	LM013301	BB	4a	DO	Medium
MC	10290104	Marmaton	Bourbon Co. SFL	L	LM013301	BB	4a	EU	Medium
MC	10290104	Marmaton	Bourbon Co. SFL	L	LM013301	BB	4a	pH	Medium
MC	10290104	Marmaton	Bronson City Lake	L	LM046201	BB	4a	EU	Medium
MC	10290104	Marmaton	Drywood Cr Near Garland	R	SC617	BB, CR	3	ECB	
MC	10290104	Marmaton	Drywood Cr Near Garland	R	SC617	BB, CR	5	Se	2023
MC	10290104	Marmaton	Drywood Cr Near Garland	R	SC617	BB, CR	5	SO4	2023
MC	10290104	Marmaton	Drywood Cr Near Garland	R	SC617	BB, CR	4a	DO	Low

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
MC	10290104	Marmaton	Elm Cr Lake	L	LM044801	BB	4a	EU	Low
MC	10290104	Marmaton	Gunn Park East Lake	L	LM065401	BB	5	EU	2023
MC	10290104	Marmaton	Gunn Park West Lake	L	LM065501	BB	5	EU	2023
MC	10290104	Marmaton	Lake Crawford State Park #2	L	LM011101	CR	4a	EU	High
MC	10290104	Marmaton	Marmaton R	R	SB324	BB	3	Bio	
MC	10290104	Marmaton	Marmaton R Near Fort Scott	R	SC559	AL, BB	3	Bio	
MC	10290104	Marmaton	Marmaton R Near Fort Scott	R	SC208	BB	5	ECB	2023
MC	10290104	Marmaton	Marmaton R Near Fort Scott	R	SC208	BB	4a	Bio	High
MC	10290104	Marmaton	Marmaton R Near Fort Scott	R	SC208	BB	4a	DO	High
MC	10290104	Marmaton	Marmaton R Near Fort Scott	R	SC559	AL, BB	4a	DO	High
MC	10290104	Marmaton	Rock Cr Lake	L	LM045201	BB	5	DO	2023
MC	10290104	Marmaton	Rock Cr Lake	L	LM045201	BB	4a	EU	High
MO	10240005	Tarkio-Wolf	Brown Co. SFL	L	LM010301	BR	4a	AP	Medium
MO	10240005	Tarkio-Wolf	Brown Co. SFL	L	LM010301	BR	4a	DO	Medium
MO	10240005	Tarkio-Wolf	Brown Co. SFL	L	LM010301	BR	4a	EU	Medium
MO	10240005	Tarkio-Wolf	Brown Co. SFL	L	LM010301	BR	4a	pH	Medium
MO	10240005	Tarkio-Wolf	Hiawatha City Lake	L	LM011601	BR	4a	Atr	Medium
MO	10240005	Tarkio-Wolf	Hiawatha City Lake	L	LM011601	BR	4a	EU	Medium
MO	10240005	Tarkio-Wolf	Mosquito Cr Near Troy	R	SC722	DP	3	ECB	
MO	10240005	Tarkio-Wolf	Troy Fair Lake	L	LM073801	DP	4a	AP	Low
MO	10240005	Tarkio-Wolf	Troy Fair Lake	L	LM073801	DP	4a	EU	Low
MO	10240005	Tarkio-Wolf	Wolf R Near Sparks	R	SC201	BR, DP	5	Atr	2023
MO	10240005	Tarkio-Wolf	Wolf R Near Sparks	R	SC201	BR, DP	4a	Bio	High
MO	10240005	Tarkio-Wolf	Wolf R Near Sparks	R	SC201	BR, DP	4a	ECB	High
MO	10240007	South Fork Big Nemaha	Nemaha Co. SFL/W.A.	L	LM010801	NM	3	EU	
MO	10240007	South Fork Big Nemaha	Pole Cr Near St. Benedict	R	SC756	NM	3	TP	
MO	10240007	South Fork Big Nemaha	Pole Cr Near St. Benedict	R	SC756	NM	3	TSS	

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
MO	10240007	South Fork Big Nemaha	Pole Cr Near St. Benedict	R	SC756	NM	5	Atr	2023
MO	10240007	South Fork Big Nemaha	Sabetha City Lake	L	LM011501	NM	5	Atr	2023
MO	10240007	South Fork Big Nemaha	Sabetha City Lake	L	LM011501	NM	4a	EU	Low
MO	10240007	South Fork Big Nemaha	South Fork Nemaha R Near Bern	R	SC234	NM, JA	5	Ars	2023
MO	10240007	South Fork Big Nemaha	South Fork Nemaha R Near Bern	R	SC234	NM, JA	5	Atr	2023
MO	10240007	South Fork Big Nemaha	South Fork Nemaha R Near Bern	R	SC234	NM, JA	5	TP	2023
MO	10240007	South Fork Big Nemaha	South Fork Nemaha R Near Bern	R	SC234	NM, JA	4a	Bio	High
MO	10240007	South Fork Big Nemaha	South Fork Nemaha R Near Bern	R	SC234	NM, JA	4a	ECB	High
MO	10240007	South Fork Big Nemaha	South Fork Nemaha R Near Seneca	R	SC682	NM, PT	3	Atr	New
MO	10240007	South Fork Big Nemaha	South Fork Nemaha R Near Seneca	R	SC682	NM, PT	5	ECB	2023
MO	10240007	South Fork Big Nemaha	South Fork Nemaha R Near Seneca	R	SC682	NM, PT	4a	Se	Low
MO	10240007	South Fork Big Nemaha	Turkey Cr Near Bern	R	SC601	MS, NM	5	TP	2023
MO	10240007	South Fork Big Nemaha	Turkey Cr Near Bern	R	SC601	MS, NM	4a	Atr	Medium
MO	10240007	South Fork Big Nemaha	Turkey Cr Near Bern	R	SC601	MS, NM	4a	FCB	Low
MO	10240008	Big Nemaha	Pony Cr Lake	L	LM073001	BR	4a	EU	High
MO	10240008	Big Nemaha	Pony Cr Near Reserve	R	SC291	NM, BR	3	ECB	
MO	10240008	Big Nemaha	Pony Cr Near Reserve	R	SC291	NM, BR	5	Atr	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
MO	10240008	Big Nemaha	Pony Cr Near Reserve	R	SC291	NM, BR	5	Se	2023
MO	10240008	Big Nemaha	Roys Cr Near Reserve	R	SC552	BR, DP	3	NO23	
MO	10240008	Big Nemaha	Roys Cr Near Reserve	R	SC552	BR, DP	5	Atr	2023
MO	10240008	Big Nemaha	Walnut Cr Near Reserve	R	SC292	BR, DP	5	Atr	2023
MO	10240008	Big Nemaha	Walnut Cr Near Reserve	R	SC292	BR, DP	5	TP	2023
MO	10240008	Big Nemaha	Walnut Cr Near Reserve	R	SC292	BR, DP	5	TSS	2023
MO	10240008	Big Nemaha	Walnut Cr Near Reserve	R	SC292	BR, DP	4a	FCB	High
MO	10240011	Independence-Sugar	Atchison Co. SFL	L	LM012601	AT	5	Atr	2023
MO	10240011	Independence-Sugar	Atchison Co. SFL	L	LM012601	AT	5	Cu	2023
MO	10240011	Independence-Sugar	Atchison Co. SFL	L	LM012601	AT	4a	AP	Low
MO	10240011	Independence-Sugar	Atchison Co. SFL	L	LM012601	AT	4a	DO	Low
MO	10240011	Independence-Sugar	Atchison Co. SFL	L	LM012601	AT	4a	EU	Medium
MO	10240011	Independence-Sugar	Atchison Co. SFL	L	LM012601	AT	4a	pH	Medium
MO	10240011	Independence-Sugar	Atchison Co. SFL	L	LM012601	AT	4a	Silt	High
MO	10240011	Independence-Sugar	Big Eleven Lake	L	LM067101	WY	4a	EU	Low
MO	10240011	Independence-Sugar	Independence Cr Near Atchison	R	SC553	DP, AT	3	ECB	
MO	10240011	Independence-Sugar	Jerry's Lake	L	LM067801	LV	4a	EU	Low
MO	10240011	Independence-Sugar	Lake Warnock (Atchison City Lake)	L	LM039801	AT	5	EU	2023
MO	10240011	Independence-Sugar	Lansing City Lake	L	LM067201	LV	3	Cu	
MO	10240011	Independence-Sugar	Lansing City Lake	L	LM067201	LV	4a	EU	Low
MO	10240011	Independence-Sugar	Lansing City Lake	L	LM067201	LV	4a	pH	Low
MO	10240011	Independence-Sugar	Merrit Lake	L	LM020801	LV	5	EU	2023
MO	10240011	Independence-Sugar	Smith Lake	L	LM020701	LV	5	EU	2023
MO	10240011	Independence-Sugar	Wyandotte Co. Lake	L	LM042401	WY	4a	EU	High
MO	10300101	Lower Missouri-Crooked	Blue R Near Stanley	R	SC205	JO	3	Diaz	
MO	10300101	Lower Missouri-Crooked	Blue R Near Stanley	R	SC205	JO	5	DO	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
MO	10300101	Lower Missouri-Crooked	Blue R Near Stanley	R	SC205	JO	5	Hg	2023
MO	10300101	Lower Missouri-Crooked	Blue R Near Stanley	R	SC205	JO	4a	Bio	Medium
MO	10300101	Lower Missouri-Crooked	Blue R Near Stanley	R	SC205	JO	4a	ECB	Medium
MO	10300101	Lower Missouri-Crooked	Heritage Park Lake	L	LM062401	JO	5	EU	2023
MO	10300101	Lower Missouri-Crooked	Indian Cr Near Leawood	R	SC204	JO	3	Diaz	
MO	10300101	Lower Missouri-Crooked	Indian Cr Near Leawood	R	SC204	JO	5	Bio	2023
MO	10300101	Lower Missouri-Crooked	Indian Cr Near Leawood	R	SC204	JO	5	Cl	2023
MO	10300101	Lower Missouri-Crooked	Indian Cr Near Leawood	R	SC204	JO	5	TP	2023
MO	10300101	Lower Missouri-Crooked	Indian Cr Near Leawood	R	SC204	JO	4a	ECB	Medium
MO	10300101	Lower Missouri-Crooked	Indian Cr Near Leawood	R	SC204	JO	4a	NO23	High
MO	10300101	Lower Missouri-Crooked	South Lake Park	L	LM067501	JO	4a	EU	Low
MO	10300101	Lower Missouri-Crooked	Stohl Park Lake	L	LM062801	JO	3	Pb	
NE	11070201	Neosho Headwaters	Allen Cr Near Emporia	R	SC628	LY	4a	DO	Medium
NE	11070201	Neosho Headwaters	Council Grove Lake	L	LM022001	MR	4a	EU	High
NE	11070201	Neosho Headwaters	Council Grove Lake	L	LM022001	MR	4a	Silt	High
NE	11070201	Neosho Headwaters	Eagle Cr Near Olpe	R	SC634	LY	5	Atr	2023
NE	11070201	Neosho Headwaters	Eagle Cr Near Olpe	R	SC634	LY	4a	DO	High
NE	11070201	Neosho Headwaters	Flint Hills N.W.R.	L	LM072401	CF	5	Silt	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
NE	11070201	Neosho Headwaters	Four Mile Cr Near Council Grove	R	SC630	MR	3	Bio	
NE	11070201	Neosho Headwaters	Four Mile Cr Near Council Grove	R	SC630	MR	5	Cd	2023
NE	11070201	Neosho Headwaters	John Redmond Lake	L	LM026001	LY, CF	4a	EU	Medium
NE	11070201	Neosho Headwaters	John Redmond Lake	L	LM026001	LY, CF	4a	Silt	Medium
NE	11070201	Neosho Headwaters	Jones Park Lake	L	LM068701	LY	4a	EU	Low
NE	11070201	Neosho Headwaters	Lake Kahola	L	LM043401	MR	4a	EU	Medium
NE	11070201	Neosho Headwaters	Munkers Cr Near Council Grove	R	SC631	WB, MR, LY	5	DO	2022
NE	11070201	Neosho Headwaters	Neosho R At Neosho Rapids	R	SC273	LY	3	ECB	
NE	11070201	Neosho Headwaters	Neosho R At Neosho Rapids	R	SC273	LY	4a	TP	High
NE	11070201	Neosho Headwaters	Neosho R At Parkerville	R	SC675	MR	4a	FCB	Medium
NE	11070201	Neosho Headwaters	Neosho R Near Americus	R	SC581	MR, LY	3	ECB	
NE	11070201	Neosho Headwaters	Neosho R Near Parkerville	R	SC637	MR	4a	Cu	Low
NE	11070201	Neosho Headwaters	Neosho R Near Parkerville	R	SC637	MR	4a	TP	High
NE	11070201	Neosho Headwaters	Olpe City Lake	L	LM041001	LY	4a	EU	High
NE	11070201	Neosho Headwaters	Olpe City Lake	L	LM041001	LY	4a	Silt	High
NE	11070202	Upper Cottonwood	Clear Cr Near Marion	R	SC690	MR, MN	3	Ala	
NE	11070202	Upper Cottonwood	Clear Cr Near Marion	R	SC690	MR, MN	3	Atr	
NE	11070202	Upper Cottonwood	Clear Cr Near Marion	R	SC690	MR, MN	4a	SO4	Low
NE	11070202	Upper Cottonwood	Doyle Cr Near Florence	R	SC120	HV	4a	SO4	Low
NE	11070202	Upper Cottonwood	French Cr Near Hillsboro	R	SC676	MN	4a	DO	Medium
NE	11070202	Upper Cottonwood	Hillsboro City Lake	L	LM020901	MN	5	EU	2023
NE	11070202	Upper Cottonwood	Marion Co. Lake	L	LM012101	MN	4a	DO	Medium
NE	11070202	Upper Cottonwood	Marion Co. Lake	L	LM012101	MN	4a	EU	Medium
NE	11070202	Upper Cottonwood	Marion Lake	L	LM020001	MN	4a	EU	High
NE	11070202	Upper Cottonwood	Mud Cr Near Marion	R	SC691	MN	5	Atr	2023
NE	11070202	Upper Cottonwood	Mud Cr Near Marion	R	SC691	MN	5	SO4	2023
NE	11070202	Upper Cottonwood	Mud Cr Near Marion	R	SC691	MN	4a	ECB	High

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
NE	11070202	Upper Cottonwood	North Cottonwood R Near Durham	R	SC636	MP, MN, HV	5	SO4	2023
NE	11070202	Upper Cottonwood	South Cottonwood R Near Canada	R	SC635	MN, CS	5	Atr	2023
NE	11070202	Upper Cottonwood	South Cottonwood R Near Canada	R	SC635	MN, CS	5	TP	2023
NE	11070203	Lower Cottonwood	Bloody Cr Near Saffordville	R	SC689	CS	3	ECB	New 3
NE	11070203	Lower Cottonwood	Bloody Cr Near Saffordville	R	SC689	CS	5	SO4	2023
NE	11070203	Lower Cottonwood	Cottonwood R Near Elmdale	R	SC627	MN, CS	5	Atr	2023
NE	11070203	Lower Cottonwood	Cottonwood R Near Elmdale	R	SC627	MN, CS	5	TSS	2023
NE	11070203	Lower Cottonwood	Cottonwood R Near Elmdale	R	SC627	MN, CS	4a	SO4	Low
NE	11070203	Lower Cottonwood	Cottonwood R Near Emporia	R	SC274	LY, CS	3	NO23	
NE	11070203	Lower Cottonwood	Cottonwood R Near Emporia	R	SC274	LY, CS	4a	TP	High
NE	11070203	Lower Cottonwood	Cottonwood R Near Plymouth	R	SC275	CS	5	TSS	2023
NE	11070203	Lower Cottonwood	Diamond Cr Near Strong City	R	SC625	MR, CS	3	ECB	
NE	11070203	Lower Cottonwood	Fox Cr Near Strong City	R	SC718	CS	4a	Bio	Medium
NE	11070203	Lower Cottonwood	Middle Cr Near Elmdale	R	SC626	MN, CS	3	ECB	
NE	11070203	Lower Cottonwood	Palmer Cr Near Strong City	R	SC719	CS	4a	Bio	Medium
NE	11070203	Lower Cottonwood	Peter Pan Lake	L	LM068901	LY	5	EU	2023
NE	11070203	Lower Cottonwood	Rock Cr near Bazaar	R	SC760	CS	3	TSS	
NE	11070203	Lower Cottonwood	South Fork Cottonwood R Near Bazaar	R	SC582	CS	4a	Bio	Medium
NE	11070204	Upper Neosho	Big Cr Near Chanute	R	SC611	AL, NO	3	ECB	
NE	11070204	Upper Neosho	Big Cr Near Chanute	R	SC611	AL, NO	5	DO	2022
NE	11070204	Upper Neosho	Chanute Santa Fe Lake	L	LM044401	NO	4a	DO	Medium
NE	11070204	Upper Neosho	Chanute Santa Fe Lake	L	LM044401	NO	4a	EU	Medium
NE	11070204	Upper Neosho	Chanute Santa Fe Lake	L	LM044401	NO	4a	pH	Medium
NE	11070204	Upper Neosho	Circle Lake	L	LM021101	WO	5	EU	2023
NE	11070204	Upper Neosho	Deer Cr Near Iola	R	SC609	AN, AL	5	DO	2022

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
NE	11070204	Upper Neosho	Deer Cr Near Iola	R	SC609	AN, AL	4a	FCB	Medium
NE	11070204	Upper Neosho	Gridley City Lake	L	LM045601	CF	4a	DO	Medium
NE	11070204	Upper Neosho	Gridley City Lake	L	LM045601	CF	4a	EU	Medium
NE	11070204	Upper Neosho	Leonard's Lake	L	LM021301	WO	5	EU	2023
NE	11070204	Upper Neosho	Long Cr Near Le Roy	R	SC695	CF	5	Atr	2023
NE	11070204	Upper Neosho	Long Cr Near Le Roy	R	SC695	CF	5	DO	2022
NE	11070204	Upper Neosho	Neosho Falls City Lake	L	LM021401	WO	5	EU	2023
NE	11070204	Upper Neosho	Owl Cr Near Humboldt	R	SC610	WO, WL	5	DO	2022
NE	11070204	Upper Neosho	Owl Cr Near Humboldt	R	SC610	WO, WL	4a	Cu	Low
NE	11070204	Upper Neosho	Turkey Cr Near Le Roy	R	SC614	CF, WO	4a	ECB	High
NE	11070204	Upper Neosho	Wolf Cr Lake	L	LM039601	CF	3	Se	
NE	11070205	Middle Neosho	Altamont City Main Lake (#1)	L	LM068001	LB	4a	EU	Low
NE	11070205	Middle Neosho	Altamont City West Lake (#3)	L	LM068201	LB	4a	EU	Low
NE	11070205	Middle Neosho	Bachelor Cr Near Labette	R	SC698	LB	4a	DO	High
NE	11070205	Middle Neosho	Bartlett City Lake	L	LM045401	LB	4a	EU	Low
NE	11070205	Middle Neosho	Canville Cr Near Shaw	R	SC612	AL, NO	4a	DO	Medium
NE	11070205	Middle Neosho	Cherry Cr Near Faulkner	R	SC605	CK	3	ECB	
NE	11070205	Middle Neosho	Cherry Cr Near Faulkner	R	SC605	CK	5	SO4	2023
NE	11070205	Middle Neosho	Cherry Cr Near Faulkner	R	SC605	CK	4a	DO	High
NE	11070205	Middle Neosho	Labette Cr Near Chetopa	R	SC571	LB	3	ECB	
NE	11070205	Middle Neosho	Labette Cr Near Labette	R	SC564	NO, LB	3	Bio	New
NE	11070205	Middle Neosho	Labette Cr Near Labette	R	SC564	NO, LB	3	ECB	
NE	11070205	Middle Neosho	Labette Cr Near Labette	R	SC564	NO, LB	5	Diaz	2023
NE	11070205	Middle Neosho	Labette Cr Near Labette	R	SC564	NO, LB	5	TP	2015
NE	11070205	Middle Neosho	Labette Cr Near Labette	R	SC564	NO, LB	4a	DO	High
NE	11070205	Middle Neosho	Lightning Cr Near Oswego	R	SC565	CR, CK	3	ECB	
NE	11070205	Middle Neosho	Lightning Cr Near Oswego	R	SC565	CR, CK	5	Atr	2023
NE	11070205	Middle Neosho	Mined Land Lake WA	L	LM038841	CK	5	Silt	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
NE	11070205	Middle Neosho	Mined Land Lake WA	L	LM038841	CK	4a	DO	Low
NE	11070205	Middle Neosho	Mined Land Lake WA	L	LM038841	CK	4a	SO4	Low
NE	11070205	Middle Neosho	Mined Land Lake 12	L	LM035901	CK	4a	SO4	Low
NE	11070205	Middle Neosho	Mined Land Lake 14	L	LM036101	CK	5	EU	2023
NE	11070205	Middle Neosho	Mined Land Lake 17	L	LM048201	CK	4a	SO4	Low
NE	11070205	Middle Neosho	Mined Land Lake 19	L	LM036501	CK	5	EU	2023
NE	11070205	Middle Neosho	Mined Land Lake 22	L	LM036801	CK	4a	SO4	Low
NE	11070205	Middle Neosho	Mined Land Lake 23	L	LM036901	CK	4a	SO4	Low
NE	11070205	Middle Neosho	Mined Land Lake 24	L	LM037001	CK	5	EU	2023
NE	11070205	Middle Neosho	Mined Land Lake 25	L	LM037101	CK	5	EU	2023
NE	11070205	Middle Neosho	Mined Land Lake 26	L	LM037201	CK	5	EU	2023
NE	11070205	Middle Neosho	Mined Land Lake 27	L	LM037301	CK	4a	SO4	Low
NE	11070205	Middle Neosho	Mined Land Lake 30	L	LM037601	CK	4a	SO4	Low
NE	11070205	Middle Neosho	Mined Land Lake 31	L	LM037701	CK	5	EU	2023
NE	11070205	Middle Neosho	Mined Land Lake 34	L	LM038001	CK	5	EU	2023
NE	11070205	Middle Neosho	Mined Land Lake 35	L	LM038101	CK	5	EU	2023
NE	11070205	Middle Neosho	Mined Land Lake 36	L	LM038201	CK	5	EU	2023
NE	11070205	Middle Neosho	Mined Land Lake 40	L	LM038601	CK	5	EU	2023
NE	11070205	Middle Neosho	Mined Land Lake 41	L	LM038701	CK	5	EU	2023
NE	11070205	Middle Neosho	Mined Land Lake 44	L	LM048401	CK	4a	SO4	Low
NE	11070205	Middle Neosho	Neosho Co. SFL	L	LM044601	NO	4a	DO	Medium
NE	11070205	Middle Neosho	Neosho Co. SFL	L	LM044601	NO	4a	EU	Medium
NE	11070205	Middle Neosho	Neosho Co. SFL	L	LM044601	NO	4a	pH	Medium
NE	11070205	Middle Neosho	Neosho R near Chetopa	R	SC214	LB	5	Bio	2022
NE	11070205	Middle Neosho	Neosho W.A.	L	LM053401	NO	3	Atr	
NE	11070205	Middle Neosho	Neosho W.A.	L	LM053401	NO	5	Cu	2023
NE	11070205	Middle Neosho	Neosho W.A.	L	LM053401	NO	4a	EU	Medium
NE	11070205	Middle Neosho	Neosho W.A.	L	LM053401	NO	4a	Pb	Medium
NE	11070205	Middle Neosho	Neosho W.A.	L	LM053401	NO	4a	pH	Medium
NE	11070205	Middle Neosho	Neosho W.A.	L	LM053401	NO	4a	Silt	Medium

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
NE	11070205	Middle Neosho	Parsons Lake	L	LM041401	NO	5	Pb	2023
NE	11070205	Middle Neosho	Parsons Lake	L	LM041401	NO	4a	EU	Medium
NE	11070205	Middle Neosho	Parsons Lake	L	LM041401	NO	4a	Silt	Medium
NE	11070206	Lake O' The Cherokees	Tar Cr At Pitcher, Oklahoma	R	SC110	CK	4a	Cd	Medium
NE	11070206	Lake O' The Cherokees	Tar Cr At Pitcher, Oklahoma	R	SC110	CK	4a	Pb	Medium
NE	11070206	Lake O' The Cherokees	Tar Cr At Pitcher, Oklahoma	R	SC110	CK	4a	Zn	Medium
NE	11070207	Spring	Cow Cr Near Lawton	R	SC567	CR, CK	5	TP	2016
NE	11070207	Spring	Cow Cr Near Lawton	R	SC567	CR, CK	4a	SO4	Low
NE	11070207	Spring	Mined Land Lake 01	L	LM035101	CR	5	EU	2023
NE	11070207	Spring	Mined Land Lake 04	L	LM035401	CR	3	pH	
NE	11070207	Spring	Mined Land Lake 04	L	LM035401	CR	3	SO4	
NE	11070207	Spring	Mined Land Lake 06	L	LM047601	CR	5	EU	2023
NE	11070207	Spring	Mined Land Lake 06	L	LM047601	CR	4a	SO4	Low
NE	11070207	Spring	Mined Land Lake 07	L	LM047801	CR	4a	SO4	Low
NE	11070207	Spring	Mined Land Lake 08	L	LM035501	CR	5	EU	2023
NE	11070207	Spring	Mined Land Lake 09	L	LM035601	CK	5	EU	2023
NE	11070207	Spring	Pittsburg College Lake	L	LM073301	CR	4a	EU	Low
NE	11070207	Spring	Pittsburg College Lake	L	LM073301	CR	4a	pH	Low
NE	11070207	Spring	Playter's Lake	L	LM069001	CR	4a	EU	Low
NE	11070207	Spring	Shawnee Cr Near Crestline	R	SC569	CK	5	Atr	2023
NE	11070207	Spring	Shawnee Cr Near Crestline	R	SC569	CK	4a	Cd	High
NE	11070207	Spring	Shawnee Cr Near Crestline	R	SC569	CK	4a	Cu	High
NE	11070207	Spring	Shawnee Cr Near Crestline	R	SC569	CK	4a	DO	High
NE	11070207	Spring	Shawnee Cr Near Crestline	R	SC569	CK	4a	Pb	High
NE	11070207	Spring	Shawnee Cr Near Crestline	R	SC569	CK	4a	Zn	High
NE	11070207	Spring	Shoal Cr Near Galena	R	SC212	CK	4a	Bio	High
NE	11070207	Spring	Shoal Cr Near Galena	R	SC212	CK	4a	Cd	High

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
NE	11070207	Spring	Shoal Cr Near Galena	R	SC212	CK	4a	Pb	High
NE	11070207	Spring	Shoal Cr Near Galena	R	SC212	CK	4a	TP	High
NE	11070207	Spring	Shoal Cr Near Galena	R	SC212	CK	4a	Zn	High
NE	11070207	Spring	Short Cr Near Galena	R	SC570	CK	5	F	2023
NE	11070207	Spring	Short Cr Near Galena	R	SC570	CK	5	Se	2023
NE	11070207	Spring	Short Cr Near Galena	R	SC570	CK	4a	Cd	High
NE	11070207	Spring	Short Cr Near Galena	R	SC570	CK	4a	Cu	High
NE	11070207	Spring	Short Cr Near Galena	R	SC570	CK	4a	Pb	High
NE	11070207	Spring	Short Cr Near Galena	R	SC570	CK	4a	TP	High
NE	11070207	Spring	Short Cr Near Galena	R	SC570	CK	4a	Zn	High
NE	11070207	Spring	Spring R Near Baxter Springs	R	SC213	CK	4a	Bio	High
NE	11070207	Spring	Spring R Near Baxter Springs	R	SC213	CK	4a	Cd	High
NE	11070207	Spring	Spring R Near Baxter Springs	R	SC213	CK	4a	Cu	High
NE	11070207	Spring	Spring R Near Baxter Springs	R	SC213	CK	4a	Pb	High
NE	11070207	Spring	Spring R Near Baxter Springs	R	SC213	CK	4a	Zn	High
NE	11070207	Spring	Spring R Near Crestline	R	SC568	CK	3	ECB	
NE	11070207	Spring	Spring R Near Crestline	R	SC568	CK	4a	Bio	High
NE	11070207	Spring	Spring R Near Crestline	R	SC568	CK	4a	Cu	High
NE	11070207	Spring	Spring R Near Crestline	R	SC568	CK	4a	Pb	High
NE	11070207	Spring	Spring R Near Crestline	R	SC568	CK	4a	Zn	High
NE	11070207	Spring	Turkey Cr Near Joplin, Missouri	R	SC211	MISSOURI	5	TP	
NE	11070207	Spring	Turkey Cr Near Joplin, Missouri	R	SC211	MISSOURI	4a	Cd	High
NE	11070207	Spring	Turkey Cr Near Joplin, Missouri	R	SC211	MISSOURI	4a	Cu	High
NE	11070207	Spring	Turkey Cr Near Joplin, Missouri	R	SC211	MISSOURI	4a	Pb	High
NE	11070207	Spring	Turkey Cr Near Joplin, Missouri	R	SC211	MISSOURI	4a	Zn	High

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
NE	11070207	Spring	Willow Cr Near Baxter Springs	R	SC747	CK	4a	Zn	High
SO	10250016	Middle Republican	Lake Jewell	L	LM062901	JW	5	EU	2023
SO	10260011	Upper North Fork Solomon	Bow Cr Near Stockton	R	SC545	PL, RO, SD, GH	5	Ars	2023
SO	10260011	Upper North Fork Solomon	Bow Cr Near Stockton	R	SC545	PL, RO, SD, GH	5	SO4	2023
SO	10260011	Upper North Fork Solomon	Bow Cr Near Stockton	R	SC545	PL, RO, SD, GH	5	TP	2023
SO	10260011	Upper North Fork Solomon	Bow Cr Near Stockton	R	SC545	PL, RO, SD, GH	4a	Se	Low
SO	10260011	Upper North Fork Solomon	Kirwin Lake	L	LM011001	PL, RO	3	Ars	
SO	10260011	Upper North Fork Solomon	Kirwin Lake	L	LM011001	PL, RO	4a	DO	Medium
SO	10260011	Upper North Fork Solomon	Kirwin Lake	L	LM011001	PL, RO	4a	EU	Medium
SO	10260011	Upper North Fork Solomon	Logan City Lake	L	LM069301	PL	4a	EU	Low
SO	10260011	Upper North Fork Solomon	North Fork Solomon R Near Glade	R	SC546	PL, NT, TH, SD	5	Ars	2023
SO	10260011	Upper North Fork Solomon	North Fork Solomon R Near Glade	R	SC546	PL, NT, TH, SD	5	TP	2023
SO	10260011	Upper North Fork Solomon	North Fork Solomon R Near Glade	R	SC546	PL, NT, TH, SD	4a	Se	Low
SO	10260011	Upper North Fork Solomon	North Fork Solomon R Near Glade	R	SC546	PL, NT, TH, SD	4a	SO4	Low
SO	10260012	Lower North Fork Solomon	Beaver Cr Near Gaylord	R	SC670	SM	5	Ars	2023
SO	10260012	Lower North Fork Solomon	Beaver Cr Near Gaylord	R	SC670	SM	5	DO	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
SO	10260012	Lower North Fork Solomon	Beaver Cr Near Gaylord	R	SC670	SM	5	TP	2023
SO	10260012	Lower North Fork Solomon	Beaver Cr Near Gaylord	R	SC670	SM	4a	Se	Low
SO	10260012	Lower North Fork Solomon	Beaver Cr Near Gaylord	R	SC670	SM	4a	SO4	Low
SO	10260012	Lower North Fork Solomon	Cedar Cr near Cedar	R	SC753	SM	5	Ars	2023
SO	10260012	Lower North Fork Solomon	Cedar Cr near Cedar	R	SC753	SM	5	Se	2023
SO	10260012	Lower North Fork Solomon	Cedar Cr near Cedar	R	SC753	SM	5	TP	2023
SO	10260012	Lower North Fork Solomon	Deer Cr Near Kirwin	R	SC721	PL	5	Ars	2023
SO	10260012	Lower North Fork Solomon	Deer Cr Near Kirwin	R	SC721	PL	5	DO	2023
SO	10260012	Lower North Fork Solomon	Deer Cr Near Kirwin	R	SC721	PL	5	TP	2023
SO	10260012	Lower North Fork Solomon	Deer Cr Near Kirwin	R	SC721	PL	4a	Se	Low
SO	10260012	Lower North Fork Solomon	Deer Cr Near Kirwin	R	SC721	PL	4a	SO4	Low
SO	10260012	Lower North Fork Solomon	North Fork Solomon R At Portis	R	SC014	SM, PL	5	Ars	2023
SO	10260012	Lower North Fork Solomon	North Fork Solomon R At Portis	R	SC014	SM, PL	5	Bio	2023
SO	10260012	Lower North Fork Solomon	North Fork Solomon R At Portis	R	SC014	SM, PL	5	TP	2023
SO	10260012	Lower North Fork Solomon	North Fork Solomon R At Portis	R	SC014	SM, PL	5	TSS	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
SO	10260012	Lower North Fork Solomon	North Fork Solomon R At Portis	R	SC014	SM, PL	4a	ECB	Low
SO	10260012	Lower North Fork Solomon	North Fork Solomon R At Portis	R	SC014	SM, PL	4a	Se	Low
SO	10260012	Lower North Fork Solomon	North Fork Solomon R At Portis	R	SC014	SM, PL	4a	SO4	Low
SO	10260012	Lower North Fork Solomon	Oak Cr Near Cawker City	R	SC544	JW, SM	5	Ars	2023
SO	10260012	Lower North Fork Solomon	Oak Cr Near Cawker City	R	SC544	JW, SM	5	DO	2023
SO	10260012	Lower North Fork Solomon	Oak Cr Near Cawker City	R	SC544	JW, SM	5	TP	2023
SO	10260012	Lower North Fork Solomon	Oak Cr Near Cawker City	R	SC544	JW, SM	4a	Se	Low
SO	10260012	Lower North Fork Solomon	Oak Cr Near Cawker City	R	SC544	JW, SM	4a	SO4	Low
SO	10260012	Lower North Fork Solomon	Twelve Mile Cr Near Downs	R	SC674	SM, OB	5	TP	2023
SO	10260012	Lower North Fork Solomon	Twelve Mile Cr Near Downs	R	SC674	SM, OB	4a	SO4	Low
SO	10260013	Upper South Fork Solomon	Antelope Lake	L	LM069501	GH	5	EU	2023
SO	10260013	Upper South Fork Solomon	Sheridan Co. SFL	L	LM069401	SD	5	Ars	2023
SO	10260013	Upper South Fork Solomon	Sheridan Co. SFL	L	LM069401	SD	4a	DO	Medium
SO	10260013	Upper South Fork Solomon	Sheridan Co. SFL	L	LM069401	SD	4a	EU	Medium
SO	10260013	Upper South Fork Solomon	South Fork Solomon R Near Damar	R	SC547	TH, SD, GH	4a	Se	Low

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
SO	10260013	Upper South Fork Solomon	South Fork Solomon R Near Damar	R	SC547	TH, SD, GH	4a	SO4	Low
SO	10260013	Upper South Fork Solomon	Webster Lake	L	LM012001	RO	3	Ars	
SO	10260013	Upper South Fork Solomon	Webster Lake	L	LM012001	RO	3	Se	
SO	10260013	Upper South Fork Solomon	Webster Lake	L	LM012001	RO	5	Silt	2023
SO	10260013	Upper South Fork Solomon	Webster Lake	L	LM012001	RO	4a	EU	Medium
SO	10260013	Upper South Fork Solomon	Webster Lake	L	LM012001	RO	4a	SO4	Low
SO	10260014	Lower South Fork Solomon	Carr Cr Near Cawker City	R	SC669	OB, MC	5	TP	2023
SO	10260014	Lower South Fork Solomon	Carr Cr Near Cawker City	R	SC669	OB, MC	5	TSS	2023
SO	10260014	Lower South Fork Solomon	Carr Cr Near Cawker City	R	SC669	OB, MC	4a	Se	Low
SO	10260014	Lower South Fork Solomon	Carr Cr Near Cawker City	R	SC669	OB, MC	4a	SO4	Low
SO	10260014	Lower South Fork Solomon	Covert Cr Near Osborne	R	SC666	OB	4a	Se	Low
SO	10260014	Lower South Fork Solomon	Covert Cr Near Osborne	R	SC666	OB	4a	SO4	Low
SO	10260014	Lower South Fork Solomon	Kill Cr Near Bloomington	R	SC665	OB	4a	Se	Low
SO	10260014	Lower South Fork Solomon	Kill Cr Near Bloomington	R	SC665	OB	4a	SO4	Low
SO	10260014	Lower South Fork Solomon	Rooks Co. SFL	L	LM011901	RO	4a	DO	Medium

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
SO	10260014	Lower South Fork Solomon	Rooks Co. SFL	L	LM011901	RO	4a	EU	Medium
SO	10260014	Lower South Fork Solomon	South Fork Solomon R Near Osborne	R	SC543	OB	5	TP	2023
SO	10260014	Lower South Fork Solomon	South Fork Solomon R Near Osborne	R	SC543	OB	5	TSS	2023
SO	10260014	Lower South Fork Solomon	South Fork Solomon R Near Osborne	R	SC542	OB, RO, RS	4a	Bio	Medium
SO	10260014	Lower South Fork Solomon	South Fork Solomon R Near Osborne	R	SC542	OB, RO, RS	4a	ECB	Low
SO	10260014	Lower South Fork Solomon	South Fork Solomon R Near Osborne	R	SC542	OB, RO, RS	4a	Se	Low
SO	10260014	Lower South Fork Solomon	South Fork Solomon R Near Osborne	R	SC542	OB, RO, RS	4a	SO4	Low
SO	10260014	Lower South Fork Solomon	South Fork Solomon R Near Osborne	R	SC543	OB	4a	Bio	Medium
SO	10260014	Lower South Fork Solomon	South Fork Solomon R Near Osborne	R	SC543	OB	4a	ECB	Low
SO	10260014	Lower South Fork Solomon	South Fork Solomon R Near Osborne	R	SC543	OB	4a	Se	Low
SO	10260014	Lower South Fork Solomon	South Fork Solomon R Near Osborne	R	SC543	OB	4a	SO4	Low
SO	10260014	Lower South Fork Solomon	South Fork Solomon R Near Woodston	R	SC737	RO	5	Ars	2023
SO	10260014	Lower South Fork Solomon	South Fork Solomon R Near Woodston	R	SC737	RO	5	DO	2023
SO	10260014	Lower South Fork Solomon	South Fork Solomon R Near Woodston	R	SC737	RO	4a	Se	Low
SO	10260014	Lower South Fork Solomon	South Fork Solomon R Near Woodston	R	SC737	RO	4a	SO4	Low

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
SO	10260014	Lower South Fork Solomon	Twin Cr Near Corinth	R	SC668	OB	4a	DO	Medium
SO	10260014	Lower South Fork Solomon	Twin Cr Near Corinth	R	SC668	OB	4a	Se	Low
SO	10260014	Lower South Fork Solomon	Twin Cr Near Corinth	R	SC668	OB	4a	SO4	Low
SO	10260015	Solomon R	Jewell Co. SFL	L	LM012801	JW	5	EU	2023
SO	10260015	Solomon R	Jewell Co. SFL	L	LM012801	JW	5	Silt	2023
SO	10260015	Solomon R	Limestone Cr Near Glen Elder	R	SC667	JW	5	Atr	2023
SO	10260015	Solomon R	Limestone Cr Near Glen Elder	R	SC667	JW	5	TP	2023
SO	10260015	Solomon R	Limestone Cr Near Glen Elder	R	SC667	JW	4a	DO	High
SO	10260015	Solomon R	Limestone Cr Near Glen Elder	R	SC667	JW	4a	Se	Low
SO	10260015	Solomon R	Limestone Cr Near Glen Elder	R	SC667	JW	4a	SO4	Low
SO	10260015	Solomon R	Ottawa Co. SFL	L	LM014101	OT	4a	AP	Medium
SO	10260015	Solomon R	Ottawa Co. SFL	L	LM014101	OT	4a	DO	Medium
SO	10260015	Solomon R	Ottawa Co. SFL	L	LM014101	OT	4a	EU	Medium
SO	10260015	Solomon R	Pipe Cr Near Minneapolis	R	SC651	CD, OT, SA	5	DO	2023
SO	10260015	Solomon R	Salt Cr Near Minneapolis	R	SC512	MC, OT, LC	5	Ars	2023
SO	10260015	Solomon R	Salt Cr Near Minneapolis	R	SC512	MC, OT, LC	5	DO	2023
SO	10260015	Solomon R	Salt Cr Near Minneapolis	R	SC512	MC, OT, LC	5	TP	2023
SO	10260015	Solomon R	Salt Cr Near Minneapolis	R	SC512	MC, OT, LC	5	TSS	2023
SO	10260015	Solomon R	Salt Cr Near Minneapolis	R	SC512	MC, OT, LC	4a	Cl	Low
SO	10260015	Solomon R	Salt Cr Near Minneapolis	R	SC512	MC, OT, LC	4a	SO4	Low
SO	10260015	Solomon R	Solomon R at Beloit	R	PWS2012301	MC	3	Atr	
SO	10260015	Solomon R	Solomon R At Niles	R	SC266	CD, OT, SA	5	Ars	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
SO	10260015	Solomon R	Solomon R At Niles	R	SC266	CD, OT, SA	5	Atr	2023
SO	10260015	Solomon R	Solomon R At Niles	R	SC266	CD, OT, SA	5	TP	2023
SO	10260015	Solomon R	Solomon R At Niles	R	SC266	CD, OT, SA	4a	Cl	Low
SO	10260015	Solomon R	Solomon R At Niles	R	SC266	CD, OT, SA	4a	SO4	Low
SO	10260015	Solomon R	Solomon R At Niles	R	SC266	CD, OT, SA	4a	TSS	Low
SO	10260015	Solomon R	Solomon R Near Glasco	R	SC511	JW, CD, MC	5	GA	2023
SO	10260015	Solomon R	Solomon R Near Glasco	R	SC511	JW, CD, MC	5	Se	2023
SO	10260015	Solomon R	Solomon R Near Glasco	R	SC511	JW, CD, MC	5	TP	2023
SO	10260015	Solomon R	Solomon R Near Glasco	R	SC511	JW, CD, MC	5	TSS	2023
SO	10260015	Solomon R	Solomon R Near Glasco	R	SC511	JW, CD, MC	4a	Cl	Low
SO	10260015	Solomon R	Solomon R Near Glasco	R	SC511	JW, CD, MC	4a	SO4	Low
SO	10260015	Solomon R	Waconda Lake	L	LM018001	OB, MC	4a	EU	Medium
SO	10260015	Solomon R	Waconda Lake	L	LM018001	OB, MC	4a	SO4	Low
SS	10260001	Smoky Hill Headwaters	Willow Cr Near Weskan	R	SC724	WA	5	DO	2023
SS	10260001	Smoky Hill Headwaters	Willow Cr Near Weskan	R	SC724	WA	5	F	2023
SS	10260002	North Fork Smoky Hill	Smoky Hill Garden Lake	L	LM070101	SH	3	F	
SS	10260002	North Fork Smoky Hill	Smoky Hill Garden Lake	L	LM070101	SH	4a	EU	Low
SS	10260003	Upper Smoky Hill	Cedar Bluff Lake	L	LM013001	TR, NS	4a	EU	Medium
SS	10260003	Upper Smoky Hill	Cedar Bluff Lake	L	LM013001	TR, NS	4a	SO4	Low
SS	10260003	Upper Smoky Hill	Smoky Hill R At Elkader	R	SC224	LG, WA, WH	5	Ars	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
SS	10260003	Upper Smoky Hill	Smoky Hill R At Elkader	R	SC224	LG, WA, WH	5	Cd	2023
SS	10260003	Upper Smoky Hill	Smoky Hill R At Elkader	R	SC224	LG, WA, WH	5	TSS	2023
SS	10260003	Upper Smoky Hill	Smoky Hill R At Elkader	R	SC224	LG, WA, WH	4a	F	Low
SS	10260003	Upper Smoky Hill	Smoky Hill R At Elkader	R	SC224	LG, WA, WH	4a	Se	Low
SS	10260003	Upper Smoky Hill	Smoky Hill R At Elkader	R	SC224	LG, WA, WH	4a	SO4	Low
SS	10260003	Upper Smoky Hill	Smoky Hill R Near Gove	R	SC739	LG, GO, SC, LE	5	F	2023
SS	10260003	Upper Smoky Hill	Smoky Hill R Near Gove	R	SC739	LG, GO, SC, LE	4a	DO	Medium
SS	10260003	Upper Smoky Hill	Smoky Hill R Near Gove	R	SC739	LG, GO, SC, LE	4a	Se	Low
SS	10260003	Upper Smoky Hill	Smoky Hill R Near Gove	R	SC739	LG, GO, SC, LE	4a	SO4	Low
SS	10260003	Upper Smoky Hill	Smoky Hill R Near Trego	R	SC550	LG, GO, TR	5	ECB	2023
SS	10260003	Upper Smoky Hill	Smoky Hill R Near Trego	R	SC550	LG, GO, TR	4a	DO	Medium
SS	10260003	Upper Smoky Hill	Smoky Hill R Near Trego	R	SC550	LG, GO, TR	4a	Se	Low
SS	10260003	Upper Smoky Hill	Smoky Hill R Near Trego	R	SC550	LG, GO, TR	4a	SO4	Low
SS	10260004	Ladder Cr	Lake Scott State Park	L	LM011201	SC	5	Ars	2023
SS	10260004	Ladder Cr	Lake Scott State Park	L	LM011201	SC	5	F	2023
SS	10260004	Ladder Cr	Lake Scott State Park	L	LM011201	SC	4a	AP	High
SS	10260004	Ladder Cr	Lake Scott State Park	L	LM011201	SC	4a	EU	High
SS	10260004	Ladder Cr	Lake Scott State Park	L	LM011201	SC	4a	pH	High
SS	10260006	Middle Smoky Hill	Beaver Cr Near Dorrance	R	SC734	RS, BT	4a	Cl	Low
SS	10260006	Middle Smoky Hill	Beaver Cr Near Dorrance	R	SC734	RS, BT	4a	SO4	Low
SS	10260006	Middle Smoky Hill	Coal Cr Near Wilson	R	SC733	RS, BT	5	DO	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
SS	10260006	Middle Smoky Hill	Coal Cr Near Wilson	R	SC733	RS, BT	5	Se	2023
SS	10260006	Middle Smoky Hill	Coal Cr Near Wilson	R	SC733	RS, BT	5	TSS	2023
SS	10260006	Middle Smoky Hill	Coal Cr Near Wilson	R	SC733	RS, BT	4a	Cl	Low
SS	10260006	Middle Smoky Hill	Coal Cr Near Wilson	R	SC733	RS, BT	4a	SO4	Low
SS	10260006	Middle Smoky Hill	Fossil Cr Near Russell	R	SC713	RS	5	Ars	2023
SS	10260006	Middle Smoky Hill	Fossil Cr Near Russell	R	SC713	RS	5	Se	2023
SS	10260006	Middle Smoky Hill	Fossil Cr Near Russell	R	SC713	RS	5	TP	2023
SS	10260006	Middle Smoky Hill	Fossil Cr Near Russell	R	SC713	RS	4a	Cl	Low
SS	10260006	Middle Smoky Hill	Fossil Cr Near Russell	R	SC713	RS	4a	SO4	Low
SS	10260006	Middle Smoky Hill	Fossil Lake	L	LM052601	RS	4a	EU	Low
SS	10260006	Middle Smoky Hill	Fossil Lake	L	LM052601	RS	4a	Silt	Low
SS	10260006	Middle Smoky Hill	Kanopolis Lake	L	LM016001	EW	4a	Cl	Low
SS	10260006	Middle Smoky Hill	Kanopolis Lake	L	LM016001	EW	4a	EU	High
SS	10260006	Middle Smoky Hill	Kanopolis Lake	L	LM016001	EW	4a	SO4	Low
SS	10260006	Middle Smoky Hill	Landon Cr Near Russell	R	SC714	RS, BT	5	Se	2023
SS	10260006	Middle Smoky Hill	Landon Cr Near Russell	R	SC714	RS, BT	4a	Cl	Low
SS	10260006	Middle Smoky Hill	Landon Cr Near Russell	R	SC714	RS, BT	4a	SO4	Low
SS	10260006	Middle Smoky Hill	Sellens Cr Near Russell	R	SC736	RS, BT	3	Atr	New
SS	10260006	Middle Smoky Hill	Sellens Cr Near Russell	R	SC736	RS, BT	5	Se	2023
SS	10260006	Middle Smoky Hill	Smoky Hill R At Ellsworth	R	SC269	EW	5	Bio	2023
SS	10260006	Middle Smoky Hill	Smoky Hill R At Ellsworth	R	SC269	EW	5	Se	2023
SS	10260006	Middle Smoky Hill	Smoky Hill R At Ellsworth	R	SC269	EW	4a	Cl	Low
SS	10260006	Middle Smoky Hill	Smoky Hill R At Ellsworth	R	SC269	EW	4a	SO4	Low
SS	10260006	Middle Smoky Hill	Smoky Hill R Near Russell	R	SC007	RS, EL, RH	5	Ars	2023
SS	10260006	Middle Smoky Hill	Smoky Hill R Near Russell	R	SC007	RS, EL, RH	5	Se	2023
SS	10260006	Middle Smoky Hill	Smoky Hill R Near Russell	R	SC007	RS, EL, RH	5	TP	2023
SS	10260006	Middle Smoky Hill	Smoky Hill R Near Russell	R	SC007	RS, EL, RH	4a	Cl	Low
SS	10260006	Middle Smoky Hill	Smoky Hill R Near Russell	R	SC007	RS, EL, RH	4a	SO4	Low
SS	10260006	Middle Smoky Hill	Smoky Hill R Near Schoenchen	R	SC539	EL, TR	5	GA	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
SS	10260006	Middle Smoky Hill	Smoky Hill R Near Schoenchen	R	SC539	EL, TR	5	Se	2023
SS	10260006	Middle Smoky Hill	Smoky Hill R Near Schoenchen	R	SC539	EL, TR	4a	SO4	Low
SS	10260006	Middle Smoky Hill	Smoky Hill R Near Wilson	R	SC723	BT	5	GA	2023
SS	10260006	Middle Smoky Hill	Smoky Hill R Near Wilson	R	SC723	BT	5	Se	2023
SS	10260006	Middle Smoky Hill	Smoky Hill R Near Wilson	R	SC723	BT	4a	Cl	Low
SS	10260006	Middle Smoky Hill	Smoky Hill R Near Wilson	R	SC723	BT	4a	SO4	Low
SS	10260007	Big Cr	Big Cr Near Hays	R	SC541	GO, EL, TR	3	ECB	
SS	10260007	Big Cr	Big Cr Near Hays	R	SC541	GO, EL, TR	5	Se	2023
SS	10260007	Big Cr	Big Cr Near Hays	R	SC541	GO, EL, TR	4a	TP	High
SS	10260007	Big Cr	Big Cr Near Munjor	R	SC540	EL, TR	5	Se	2023
SS	10260007	Big Cr	Big Cr Near Munjor	R	SC540	EL, TR	5	SO4	2023
SS	10260007	Big Cr	Big Cr Near Munjor	R	SC540	EL, TR	4a	ECB	Low
SS	10260007	Big Cr	Big Cr Near Munjor	R	SC540	EL, TR	4a	NO23	Low
SS	10260007	Big Cr	Big Cr Near Munjor	R	SC540	EL, TR	4a	TP	High
SS	10260007	Big Cr	Big Cr Near Munjor	R	SC540	EL, TR	4a	TSS	Low
SS	10260007	Big Cr	Big Cr near Russell	R	SC752	RS, EL	3	Bio	New
SS	10260007	Big Cr	Big Cr near Russell	R	SC752	RS, EL	4a	TP	High
SS	10260007	Big Cr	Big Cr near Russell	R	SC752	RS, EL	4a	TSS	Low
SS	10260007	Big Cr	Big Cr Oxbow	L	LM070301	EL	4a	EU	Low
SS	10260007	Big Cr	Ellis City Lake	L	LM069601	EL	4a	EU	Low
SS	10260007	Big Cr	North Fork Big Cr Near Walker	R	SC715	EL	5	Se	2023
SS	10260007	Big Cr	North Fork Big Cr Near Walker	R	SC715	EL	4a	Cl	Low
SS	10260007	Big Cr	North Fork Big Cr Near Walker	R	SC715	EL	4a	TP	High
SS	10260008	Lower Smoky Hill	Carry Cr Near Lyona	R	SC708	DK	4a	SO4	Low
SS	10260008	Lower Smoky Hill	Chapman Cr Near Sutphen	R	SC515	CY, OT, DK	5	TSS	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
SS	10260008	Lower Smoky Hill	Chapman Cr Near Sutphen	R	SC515	CY, OT, DK	4a	SO4	Low
SS	10260008	Lower Smoky Hill	Geary Co. SFL	L	LM043201	GE	4a	EU	Medium
SS	10260008	Lower Smoky Hill	Gypsum Cr Near Solomon	R	SC641	SA, MP	5	Atr	2023
SS	10260008	Lower Smoky Hill	Gypsum Cr Near Solomon	R	SC641	SA, MP	4a	SO4	Low
SS	10260008	Lower Smoky Hill	Herington City Lake	L	LM069701	DK	3	Ars	
SS	10260008	Lower Smoky Hill	Herington City Lake	L	LM069701	DK	4a	EU	Low
SS	10260008	Lower Smoky Hill	Herington City Park Lake	L	LM072801	DK	4a	EU	Low
SS	10260008	Lower Smoky Hill	Herington Reservoir	L	LM047201	DK	3	Ars	
SS	10260008	Lower Smoky Hill	Herington Reservoir	L	LM047201	DK	5	Silt	2023
SS	10260008	Lower Smoky Hill	Herington Reservoir	L	LM047201	DK	4a	Atr	Medium
SS	10260008	Lower Smoky Hill	Herington Reservoir	L	LM047201	DK	4a	DO	High
SS	10260008	Lower Smoky Hill	Herington Reservoir	L	LM047201	DK	4a	EU	High
SS	10260008	Lower Smoky Hill	Holland Cr Near Sand Springs	R	SC642	DK	5	ECB	2023
SS	10260008	Lower Smoky Hill	Holland Cr Near Sand Springs	R	SC642	DK	5	Se	2023
SS	10260008	Lower Smoky Hill	Holland Cr Near Sand Springs	R	SC642	DK	4a	DO	High
SS	10260008	Lower Smoky Hill	Holland Cr Near Sand Springs	R	SC642	DK	4a	SO4	Low
SS	10260008	Lower Smoky Hill	Lakewood Park Lake	L	LM069801	SA	3	Pb	
SS	10260008	Lower Smoky Hill	Lakewood Park Lake	L	LM069801	SA	3	Silt	
SS	10260008	Lower Smoky Hill	Lakewood Park Lake	L	LM069801	SA	4a	EU	Low
SS	10260008	Lower Smoky Hill	McPherson Co. SFL	L	LM013501	MP	4a	AP	Medium
SS	10260008	Lower Smoky Hill	McPherson Co. SFL	L	LM013501	MP	4a	DO	Medium
SS	10260008	Lower Smoky Hill	McPherson Co. SFL	L	LM013501	MP	4a	EU	Medium
SS	10260008	Lower Smoky Hill	McPherson Co. SFL	L	LM013501	MP	4a	pH	Medium
SS	10260008	Lower Smoky Hill	Mud Cr Near Abilene	R	SC643	DK	5	TP	2018
SS	10260008	Lower Smoky Hill	Mud Cr Near Abilene	R	SC643	DK	4a	SO4	Low
SS	10260008	Lower Smoky Hill	Sharps Cr Near Freemount	R	SC749	MP, RC	5	TP	2018

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
SS	10260008	Lower Smoky Hill	Smoky Hill R At Enterprise	R	SC265	DK, SA	5	Ars	2023
SS	10260008	Lower Smoky Hill	Smoky Hill R At Enterprise	R	SC265	DK, SA	5	GA	2023
SS	10260008	Lower Smoky Hill	Smoky Hill R At Enterprise	R	SC265	DK, SA	5	TP	2018
SS	10260008	Lower Smoky Hill	Smoky Hill R At Enterprise	R	SC265	DK, SA	4a	Bio	Medium
SS	10260008	Lower Smoky Hill	Smoky Hill R At Enterprise	R	SC265	DK, SA	4a	Cl	Low
SS	10260008	Lower Smoky Hill	Smoky Hill R At Enterprise	R	SC265	DK, SA	4a	SO4	Low
SS	10260008	Lower Smoky Hill	Smoky Hill R At Enterprise	R	SC265	DK, SA	4a	TSS	Low
SS	10260008	Lower Smoky Hill	Smoky Hill R At Junction City	R	SC264	GE, DK	3	ECB	
SS	10260008	Lower Smoky Hill	Smoky Hill R At Junction City	R	SC264	GE, DK	5	Bio	2022
SS	10260008	Lower Smoky Hill	Smoky Hill R At Junction City	R	SC264	GE, DK	5	TP	2018
SS	10260008	Lower Smoky Hill	Smoky Hill R At Junction City	R	SC264	GE, DK	4a	Cl	Low
SS	10260008	Lower Smoky Hill	Smoky Hill R At Junction City	R	SC264	GE, DK	4a	SO4	Low
SS	10260008	Lower Smoky Hill	Smoky Hill R At Junction City	R	SC264	GE, DK	4a	TSS	Low
SS	10260008	Lower Smoky Hill	Smoky Hill R Near Mentor	R	SC514	SA, EW, MP	4a	ECB	High
SS	10260008	Lower Smoky Hill	Smoky Hill R Near Mentor	R	SC514	SA, EW, MP	4a	TSS	Low
SS	10260008	Lower Smoky Hill	Smoky Hill R Near Salina	R	SC268	SA, MP	5	NO23	2018
SS	10260008	Lower Smoky Hill	Smoky Hill R Near Salina	R	SC268	SA, MP	5	TP	2018
SS	10260008	Lower Smoky Hill	Smoky Hill R Near Salina	R	SC268	SA, MP	4a	Bio	Medium
SS	10260008	Lower Smoky Hill	Smoky Hill R Near Salina	R	SC268	SA, MP	4a	TSS	Low
SS	10260008	Lower Smoky Hill	Turkey Cr Near Abilene	R	SC644	DK, MN	4a	SO4	Low
SS	10260009	Upper Saline	Paradise Cr Near Waldo	R	SC538	OB, RO, RS	5	Ars	2023
SS	10260009	Upper Saline	Paradise Cr Near Waldo	R	SC538	OB, RO, RS	5	DO	2023
SS	10260009	Upper Saline	Paradise Cr Near Waldo	R	SC538	OB, RO, RS	5	TSS	2023
SS	10260009	Upper Saline	Paradise Cr Near Waldo	R	SC538	OB, RO, RS	4a	Cl	Low
SS	10260009	Upper Saline	Paradise Cr Near Waldo	R	SC538	OB, RO, RS	4a	Se	Low
SS	10260009	Upper Saline	Paradise Cr Near Waldo	R	SC538	OB, RO, RS	4a	SO4	Low
SS	10260009	Upper Saline	Plainville Township Lake	L	LM070001	RO	4a	EU	Low

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
SS	10260009	Upper Saline	Saline R Near Hays	R	SC548	TH, RO, SD, GH, EL, TR	3	ECB	
SS	10260009	Upper Saline	Saline R Near Hays	R	SC548	TH, RO, SD, GH, EL, TR	5	Ars	2023
SS	10260009	Upper Saline	Saline R Near Hays	R	SC548	TH, RO, SD, GH, EL, TR	5	DO	2023
SS	10260009	Upper Saline	Saline R Near Hays	R	SC548	TH, RO, SD, GH, EL, TR	4a	Se	Low
SS	10260009	Upper Saline	Saline R Near Hays	R	SC548	TH, RO, SD, GH, EL, TR	4a	SO4	Low
SS	10260009	Upper Saline	Saline R Near Russell	R	SC011	RO, RS, EL	4a	Cl	Low
SS	10260009	Upper Saline	Saline R Near Russell	R	SC011	RO, RS, EL	4a	Se	Low
SS	10260009	Upper Saline	Saline R Near Russell	R	SC011	RO, RS, EL	4a	SO4	Low
SS	10260009	Upper Saline	Sheridan W.A.	L	LM014501	SD	4a	FCB	Low
SS	10260009	Upper Saline	Sheridan W.A.	L	LM014501	SD	4a	pH	Low
SS	10260009	Upper Saline	Wilson Lake	L	LM014001	RS	4a	Cl	Low
SS	10260009	Upper Saline	Wilson Lake	L	LM014001	RS	4a	SO4	Low
SS	10260010	Lower Saline	Bullfoot Cr Near Lincoln	R	SC672	LC, EW	3	ECB	
SS	10260010	Lower Saline	Bullfoot Cr Near Lincoln	R	SC672	LC, EW	4a	SO4	Low
SS	10260010	Lower Saline	Elkhorn Cr Near Lincoln	R	SC671	LC, EW	4a	SO4	Low
SS	10260010	Lower Saline	Mulberry Cr Near Salina	R	SC640	SA, EW, MP	5	Cu	2023
SS	10260010	Lower Saline	Mulberry Cr Near Salina	R	SC640	SA, EW, MP	5	TP	2018
SS	10260010	Lower Saline	Saline Co. SFL	L	LM013701	SA	3	Silt	
SS	10260010	Lower Saline	Saline R Near Beverly	R	SC513	LC	5	Se	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
SS	10260010	Lower Saline	Saline R Near Beverly	R	SC513	LC	5	TSS	2023
SS	10260010	Lower Saline	Saline R Near Beverly	R	SC513	LC	4a	Cl	Low
SS	10260010	Lower Saline	Saline R Near Beverly	R	SC513	LC	4a	SO4	Low
SS	10260010	Lower Saline	Saline R Near New Cambria	R	SC267	OT, LC,SA	3	ECB	
SS	10260010	Lower Saline	Saline R Near New Cambria	R	SC267	OT, LC,SA	5	Bio	2023
SS	10260010	Lower Saline	Saline R Near New Cambria	R	SC267	OT, LC,SA	5	TP	2018
SS	10260010	Lower Saline	Saline R Near New Cambria	R	SC267	OT, LC,SA	5	TSS	2023
SS	10260010	Lower Saline	Saline R Near New Cambria	R	SC267	OT, LC,SA	4a	Cl	Low
SS	10260010	Lower Saline	Saline R Near New Cambria	R	SC267	OT, LC,SA	4a	SO4	Low
SS	10260010	Lower Saline	Spillman Cr Near Lincoln	R	SC673	MC, LC	5	Ars	2023
SS	10260010	Lower Saline	Spillman Cr Near Lincoln	R	SC673	MC, LC	5	Atr	2023
SS	10260010	Lower Saline	Spillman Cr Near Lincoln	R	SC673	MC, LC	5	TP	2023
SS	10260010	Lower Saline	Spillman Cr Near Lincoln	R	SC673	MC, LC	5	TSS	2023
SS	10260010	Lower Saline	Spillman Cr Near Lincoln	R	SC673	MC, LC	4a	DO	High
SS	10260010	Lower Saline	Wolf Cr Near Sylvan Grove	R	SC537	OB, RS	5	DO	2023
SS	10260010	Lower Saline	Wolf Cr Near Sylvan Grove	R	SC537	OB, RS	5	TSS	2023
SS	10260010	Lower Saline	Wolf Cr Near Sylvan Grove	R	SC537	OB, RS	4a	Cl	Low
SS	10260010	Lower Saline	Wolf Cr Near Sylvan Grove	R	SC537	OB, RS	4a	Se	Low
SS	10260010	Lower Saline	Wolf Cr Near Sylvan Grove	R	SC537	OB, RS	4a	SO4	Low
UA	11030001	Middle Arkansas-Lake McKinney	Arkansas R At Coolidge	R	SC223	HM	3	NO23	
UA	11030001	Middle Arkansas-Lake McKinney	Arkansas R At Coolidge	R	SC223	HM	5	F	2023
UA	11030001	Middle Arkansas-Lake McKinney	Arkansas R At Coolidge	R	SC223	HM	5	GA	2023
UA	11030001	Middle Arkansas-Lake McKinney	Arkansas R At Coolidge	R	SC223	HM	4a	B	Medium
UA	11030001	Middle Arkansas-Lake McKinney	Arkansas R At Coolidge	R	SC223	HM	4a	Se	High

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
UA	11030001	Middle Arkansas-Lake McKinney	Arkansas R At Coolidge	R	SC223	HM	4a	SO4	Medium
UA	11030001	Middle Arkansas-Lake McKinney	Arkansas R Near Deerfield	R	SC598	KE, HM	5	F	2023
UA	11030001	Middle Arkansas-Lake McKinney	Arkansas R Near Deerfield	R	SC598	KE, HM	5	GA	2023
UA	11030001	Middle Arkansas-Lake McKinney	Arkansas R Near Deerfield	R	SC598	KE, HM	5	TSS	2023
UA	11030001	Middle Arkansas-Lake McKinney	Arkansas R Near Deerfield	R	SC598	KE, HM	4a	B	Medium
UA	11030001	Middle Arkansas-Lake McKinney	Arkansas R Near Deerfield	R	SC598	KE, HM	4a	Se	High
UA	11030001	Middle Arkansas-Lake McKinney	Arkansas R Near Deerfield	R	SC598	KE, HM	4a	SO4	Medium
UA	11030001	Middle Arkansas-Lake McKinney	Beymer Lake	L	LM071001	JO	3	F	
UA	11030001	Middle Arkansas-Lake McKinney	Beymer Lake	L	LM071001	JO	3	Se	
UA	11030001	Middle Arkansas-Lake McKinney	Hamilton Co. SFL	L	LM016101	HM	5	DO	2023
UA	11030001	Middle Arkansas-Lake McKinney	Hamilton Co. SFL	L	LM016101	HM	4a	AP	Low
UA	11030001	Middle Arkansas-Lake McKinney	Hamilton Co. SFL	L	LM016101	HM	4a	Cl	Low
UA	11030001	Middle Arkansas-Lake McKinney	Hamilton Co. SFL	L	LM016101	HM	4a	EU	Low
UA	11030001	Middle Arkansas-Lake McKinney	Hamilton Co. SFL	L	LM016101	HM	4a	Silt	Low
UA	11030001	Middle Arkansas-Lake McKinney	Hamilton Co. SFL	L	LM016101	HM	4a	SO4	Low

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
UA	11030001	Middle Arkansas-Lake McKinney	Hamilton W.A.	L	LM016141	HM	4a	Cl	Low
UA	11030001	Middle Arkansas-Lake McKinney	Hamilton W.A.	L	LM016141	HM	4a	DO	Low
UA	11030001	Middle Arkansas-Lake McKinney	Hamilton W.A.	L	LM016141	HM	4a	EU	Low
UA	11030001	Middle Arkansas-Lake McKinney	Hamilton W.A.	L	LM016141	HM	4a	Silt	Low
UA	11030001	Middle Arkansas-Lake McKinney	Hamilton W.A.	L	LM016141	HM	4a	SO4	Low
UA	11030003	Arkansas-Dodge City	Arkansas R At Pierceville	R	SC286	FI, KE	4a	B	Medium
UA	11030003	Arkansas-Dodge City	Arkansas R At Pierceville	R	SC286	FI, KE	4a	FCB	High
UA	11030003	Arkansas-Dodge City	Arkansas R At Pierceville	R	SC286	FI, KE	4a	pH	Medium
UA	11030003	Arkansas-Dodge City	Arkansas R At Pierceville	R	SC286	FI, KE	4a	Se	High
UA	11030003	Arkansas-Dodge City	Arkansas R At Pierceville	R	SC286	FI, KE	4a	SO4	Medium
UA	11030003	Arkansas-Dodge City	Arkansas R At Pierceville	R	SC286	FI, KE	4c	TP	Low
UA	11030003	Arkansas-Dodge City	Arkansas R At Pierceville	R	SC286	FI, KE	4c	TSS	Low
UA	11030003	Arkansas-Dodge City	Lake Charles	L	LM071101	FO	4a	EU	Low
UA	11030004	Arkansas-Pickerel	Arkansas R Near Dundee	R	SC584	PN, ED, FO	5	Se	2023
UA	11030004	Arkansas-Pickerel	Arkansas R Near Dundee	R	SC584	PN, ED, FO	4a	ECB	High
UA	11030004	Arkansas-Pickerel	Arkansas R Near Dundee	R	SC584	PN, ED, FO	4a	SO4	Medium
UA	11030004	Arkansas-Pickerel	Arkansas R Near Ford	R	SC594	GY, FO, HS	5	F	2023
UA	11030004	Arkansas-Pickerel	Arkansas R Near Ford	R	SC594	GY, FO, HS	5	Se	2023
UA	11030004	Arkansas-Pickerel	Arkansas R Near Ford	R	SC594	GY, FO, HS	5	TP	2023
UA	11030004	Arkansas-Pickerel	Arkansas R Near Ford	R	SC594	GY, FO, HS	4a	ECB	High
UA	11030004	Arkansas-Pickerel	Arkansas R Near Ford	R	SC594	GY, FO, HS	4a	SO4	Medium
UA	11030004	Arkansas-Pickerel	Arkansas R Near Great Bend	R	SC284	BT, SF	5	Atr	2023
UA	11030004	Arkansas-Pickerel	Arkansas R Near Great Bend	R	SC284	BT, SF	5	GA	2023
UA	11030004	Arkansas-Pickerel	Arkansas R Near Great Bend	R	SC284	BT, SF	5	Se	2023
UA	11030004	Arkansas-Pickerel	Arkansas R Near Great Bend	R	SC284	BT, SF	5	TP	2023

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
UA	11030004	Arkansas-Pickerel	Arkansas R Near Great Bend	R	SC284	BT, SF	4a	Bio	Medium
UA	11030004	Arkansas-Pickerel	Arkansas R Near Great Bend	R	SC284	BT, SF	4a	FCB	High
UA	11030004	Arkansas-Pickerel	Arkansas R Near Great Bend	R	SC284	BT, SF	4a	SO4	Medium
UA	11030004	Arkansas-Pickerel	Arkansas R Near Kinsley	R	SC587	ED, FO	5	Se	2023
UA	11030004	Arkansas-Pickerel	Arkansas R Near Kinsley	R	SC587	ED, FO	4a	ECB	High
UA	11030004	Arkansas-Pickerel	Arkansas R Near Kinsley	R	SC587	ED, FO	4a	F	Medium
UA	11030004	Arkansas-Pickerel	Mulberry Cr Near Ford	R	SC700	FO	5	TSS	2023
UA	11030004	Arkansas-Pickerel	Mulberry Cr Near Ford	R	SC700	FO	4a	DO	Low
UA	11030005	Pawnee	Concannon SFL	L	LM053601	FI	3	Ars	
UA	11030005	Pawnee	Concannon SFL	L	LM053601	FI	5	B	2023
UA	11030005	Pawnee	Concannon SFL	L	LM053601	FI	5	F	2023
UA	11030005	Pawnee	Concannon SFL	L	LM053601	FI	5	SO4	2023
UA	11030005	Pawnee	Concannon SFL	L	LM053601	FI	4a	EU	Low
UA	11030005	Pawnee	Pawnee R Near Burdett	R	SC586	NX, FI, HG	5	TP	2023
UA	11030005	Pawnee	Pawnee R Near Burdett	R	SC586	NX, FI, HG	5	TSS	2023
UA	11030005	Pawnee	Pawnee R Near Burdett	R	SC586	NX, FI, HG	4a	Atr	Medium
UA	11030005	Pawnee	Pawnee R Near Burdett	R	SC586	NX, FI, HG	4a	Cu	Low
UA	11030005	Pawnee	Pawnee R Near Burdett	R	SC586	NX, FI, HG	4a	DO	Low
UA	11030005	Pawnee	Pawnee R Near Burdett	R	SC586	NX, FI, HG	4a	ECB	High
UA	11030005	Pawnee	Pawnee R Near Burdett	R	SC586	NX, FI, HG	4a	Pb	Low
UA	11030005	Pawnee	Pawnee R Near Larned	R	SC585	PN	5	TP	2023
UA	11030005	Pawnee	Pawnee R Near Larned	R	SC585	PN	4a	Atr	Medium
UA	11030005	Pawnee	Pawnee R Near Larned	R	SC585	PN	4a	Cu	Low
UA	11030005	Pawnee	Pawnee R Near Larned	R	SC585	PN	4a	DO	Low
UA	11030005	Pawnee	Pawnee R Near Larned	R	SC585	PN	4a	FCB	High
UA	11030005	Pawnee	Pawnee R Near Larned	R	SC585	PN	4a	Pb	Low
UA	11030006	Buckner	Boy Scout Lake	L	LM070601	HG	3	EU	
UA	11030006	Buckner	Ford Co. Lake	L	LM070801	FO	4a	DO	High
UA	11030006	Buckner	Ford Co. Lake	L	LM070801	FO	4a	EU	High
UA	11030006	Buckner	Ford Co. Lake	L	LM070801	FO	4a	pH	High

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
UA	11030006	Buckner	Hain SFL	L	LM070901	FO	5	EU	2023
UA	11030006	Buckner	Horsethief Canyon Lake	L	LM055001	HG	5	EU	2023
UA	11030006	Buckner	Jetmore Lake	L	LM073901	HG	4a	AP	Low
UA	11030006	Buckner	Jetmore Lake	L	LM073901	HG	4a	EU	Low
UA	11030007	Upper Walnut Cr	Walnut Cr At Ness City	R	SC595	SC, LE, NS	5	Ars	2023
UA	11030007	Upper Walnut Cr	Walnut Cr At Ness City	R	SC595	SC, LE, NS	4a	Se	Low
UA	11030007	Upper Walnut Cr	Walnut Cr At Ness City	R	SC595	SC, LE, NS	4a	SO4	Low
UA	11030008	Lower Walnut Cr	Goodman SFL	L	LM052401	NS	3	Se	
UA	11030008	Lower Walnut Cr	Goodman SFL	L	LM052401	NS	5	EU	2023
UA	11030008	Lower Walnut Cr	Goodman SFL	L	LM052401	NS	5	SO4	2023
UA	11030008	Lower Walnut Cr	Memorial Park Lake	L	LM071501	BT	4a	EU	Low
UA	11030008	Lower Walnut Cr	Stone Lake	L	LM074001	BT	4a	EU	Low
UA	11030008	Lower Walnut Cr	Walnut Cr Near Alexander	R	SC596	LE, NS	5	Ars	2023
UA	11030008	Lower Walnut Cr	Walnut Cr Near Alexander	R	SC596	LE, NS	5	TSS	2023
UA	11030008	Lower Walnut Cr	Walnut Cr Near Alexander	R	SC596	LE, NS	4a	DO	Low
UA	11030008	Lower Walnut Cr	Walnut Cr Near Alexander	R	SC596	LE, NS	4a	Se	Low
UA	11030008	Lower Walnut Cr	Walnut Cr Near Alexander	R	SC596	LE, NS	4a	SO4	Low
UA	11030008	Lower Walnut Cr	Walnut Cr Near Heizer	R	SC597	RH, BT	3	ECB	
UA	11030008	Lower Walnut Cr	Walnut Cr Near Heizer	R	SC597	RH, BT	5	Ars	2023
UA	11030008	Lower Walnut Cr	Walnut Cr Near Heizer	R	SC597	RH, BT	5	TP	2023
UA	11030008	Lower Walnut Cr	Walnut Cr Near Heizer	R	SC597	RH, BT	5	TSS	2023
UA	11030008	Lower Walnut Cr	Walnut Cr Near Heizer	R	SC597	RH, BT	4a	DO	Low
UA	11030008	Lower Walnut Cr	Walnut Cr Near Heizer	R	SC597	RH, BT	4a	Se	Low
UA	11030008	Lower Walnut Cr	Walnut Cr Near Heizer	R	SC597	RH, BT	4a	SO4	Low
UR	10250001	Arikaree	Arikaree R Near Haigler, Nebraska	R	SC226	CN	3	ECB	
UR	10250001	Arikaree	Arikaree R Near Haigler, Nebraska	R	SC226	CN	5	DO	2023
UR	10250001	Arikaree	Arikaree R Near Haigler, Nebraska	R	SC226	CN	4a	F	Low

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
UR	10250001	Arikaree	Arikaree R Near Haigler, Nebraska	R	SC226	CN	4a	Se	Low
UR	10250003	South Fork Republican	Saint Francis W.A.	L	LM071401	CN	3	Cu	
UR	10250003	South Fork Republican	Saint Francis W.A.	L	LM071401	CN	3	EU	
UR	10250003	South Fork Republican	South Fork Republican R Near Benkelman, Nebraska	R	SC227	CN	4a	F	Low
UR	10250003	South Fork Republican	South Fork Republican R Near St. Francis	R	SC225	CN	3	Bio	
UR	10250003	South Fork Republican	South Fork Republican R Near St. Francis	R	SC225	CN	5	GA	2023
UR	10250003	South Fork Republican	South Fork Republican R Near St. Francis	R	SC225	CN	4a	F	Low
UR	10250011	Lower Sappa	Sappa Cr Near Beaver City, Nebraska	R	SC229	RA, DC, NT, SH, TH	5	Ars	2023
UR	10250011	Lower Sappa	Sappa Cr Near Beaver City, Nebraska	R	SC229	RA, DC, NT, SH, TH	5	DO	2023
UR	10250011	Lower Sappa	Sappa Cr Near Beaver City, Nebraska	R	SC229	RA, DC, NT, SH, TH	5	Se	2023
UR	10250011	Lower Sappa	Sappa Cr Near Beaver City, Nebraska	R	SC229	RA, DC, NT, SH, TH	5	TP	2023
UR	10250012	South Fork Beaver	Atwood Township Lake	L	LM071201	RA	3	EU	
UR	10250012	South Fork Beaver	Atwood Township Lake	L	LM071201	RA	3	F	
UR	10250012	South Fork Beaver	Atwood Township Lake	L	LM071201	RA	3	SO4	
UR	10250014	Beaver Cr	Beaver Cr At Cedar Bluffs	R	SC228	CN, RA, DC, SH	3	TP	
UR	10250014	Beaver Cr	Beaver Cr At Cedar Bluffs	R	SC228	CN, RA, DC, SH	4a	DO	Low
UR	10250014	Beaver Cr	Beaver Cr At Cedar Bluffs	R	SC228	CN, RA, DC, SH	4a	F	Low

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
UR	10250015	Prairie Dog Cr	Colby City Lake	L	LM071301	TH	3	Pb	
UR	10250015	Prairie Dog Cr	Colby City Lake	L	LM071301	TH	4a	EU	Low
UR	10250015	Prairie Dog Cr	Norton Lake (Sebelius Lake)	L	LM010001	NT	4a	DO	Low
UR	10250015	Prairie Dog Cr	Norton Lake (Sebelius Lake)	L	LM010001	NT	4a	EU	High
UR	10250015	Prairie Dog Cr	Norton Lake (Sebelius Lake)	L	LM010001	NT	4a	pH	Low
UR	10250015	Prairie Dog Cr	Prairie Dog Cr Near Dellvale	R	SC549	DC, TH	5	Ars	2023
UR	10250015	Prairie Dog Cr	Prairie Dog Cr Near Dellvale	R	SC549	DC, TH	5	DO	2023
UR	10250015	Prairie Dog Cr	Prairie Dog Cr Near Dellvale	R	SC549	DC, TH	4a	TP	Low
UR	10250015	Prairie Dog Cr	Prairie Dog Cr Near Woodruff	R	SC230	PL, NT	5	Ars	2023
UR	10250015	Prairie Dog Cr	Prairie Dog Cr Near Woodruff	R	SC230	PL, NT	5	TP	2023
UR	10250015	Prairie Dog Cr	Prairie Dog Cr Near Woodruff	R	SC230	PL, NT	4a	DO	High
VE	11070101	Upper Verdigris	Chetopa Cr Near Neodesha	R	SC696	WL, NO	4a	DO	Medium
VE	11070101	Upper Verdigris	Chetopa Cr Near Neodesha	R	SC696	WL, NO	4a	FCB	Medium
VE	11070101	Upper Verdigris	Eureka Lake	L	LM040201	GW	4a	EU	Medium
VE	11070101	Upper Verdigris	Eureka Lake	L	LM040201	GW	4a	Silt	Medium
VE	11070101	Upper Verdigris	Toronto Lake	L	LM024001	GW, WO	5	Pb	2023
VE	11070101	Upper Verdigris	Toronto Lake	L	LM024001	GW, WO	4a	DO	High
VE	11070101	Upper Verdigris	Toronto Lake	L	LM024001	GW, WO	4a	EU	High
VE	11070101	Upper Verdigris	Toronto Lake	L	LM024001	GW, WO	4a	Silt	High
VE	11070101	Upper Verdigris	Verdigris R Near Virgil	R	SC289	LY, CS, GW	5	ECB	2023
VE	11070101	Upper Verdigris	Wilson Co. SFL	L	LM015101	WL	4a	DO	Medium
VE	11070101	Upper Verdigris	Wilson Co. SFL	L	LM015101	WL	4a	EU	Medium
VE	11070101	Upper Verdigris	Woodson W.A.	L	LM011841	WO	5	Silt	2023
VE	11070101	Upper Verdigris	Woodson W.A.	L	LM011841	WO	4a	DO	Medium
VE	11070101	Upper Verdigris	Woodson W.A.	L	LM011841	WO	4a	EU	Medium
VE	11070101	Upper Verdigris	Woodson W.A.	L	LM011841	WO	4a	FCB	Medium
VE	11070102	Fall R	Fall R Lake	L	LM023001	GW	4a	DO	High

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
VE	11070102	Fall R	Fall R Lake	L	LM023001	GW	4a	Silt	High
VE	11070102	Fall R	Fall R Near Climax	R	SC575	GW, BU	4a	FCB	High
VE	11070103	Middle Verdigris	Big Hill Cr Near Avian	R	SC607	MG, LB	4a	DO	Medium
VE	11070103	Middle Verdigris	Big Hill Cr Near Avian	R	SC607	MG, LB	4a	ECB	Medium
VE	11070103	Middle Verdigris	Big Hill Lake	L	LM031001	NO, LB	4a	EU	High
VE	11070103	Middle Verdigris	Drum Cr Near Independence	R	SC699	NO, MG	3	ECB	
VE	11070103	Middle Verdigris	Drum Cr Near Independence	R	SC699	NO, MG	5	DO	2023
VE	11070103	Middle Verdigris	La Claire Lake	L	LM072901	MG	4a	EU	Low
VE	11070103	Middle Verdigris	Lake Tanko (Cherryvale City Lake)	L	LM071601	MG	4a	EU	Low
VE	11070103	Middle Verdigris	Montgomery Co. SFL	L	LM010701	MG	4a	DO	Medium
VE	11070103	Middle Verdigris	Montgomery Co. SFL	L	LM010701	MG	4a	EU	Medium
VE	11070103	Middle Verdigris	Montgomery Co. SFL	L	LM010701	MG	4a	pH	Medium
VE	11070103	Middle Verdigris	Onion Cr Near Coffeyville	R	SC608	MG	4a	DO	Medium
VE	11070103	Middle Verdigris	Pumpkin Cr Near Coffeyville	R	SC606	LB	3	ECB	
VE	11070103	Middle Verdigris	Pumpkin Cr Near Coffeyville	R	SC606	LB	4a	DO	Medium
VE	11070103	Middle Verdigris	Verdigris R Near Coffeyville	R	SC215	MG	5	Se	2023
VE	11070103	Middle Verdigris	Verdigris R Near Coffeyville	R	SC215	MG	4a	Bio	Medium
VE	11070103	Middle Verdigris	Verdigris R Near Coffeyville	R	SC215	MG	4a	FCB	Medium
VE	11070103	Middle Verdigris	Verdigris R Near Independence	R	SC563	MG	4a	Bio	Medium
VE	11070103	Middle Verdigris	Verdigris R Near Independence	R	SC563	MG	4a	FCB	Medium
VE	11070103	Middle Verdigris	Verdigris R Near Sycamore	R	SC105	WL, MG	3	ECB	
VE	11070103	Middle Verdigris	Verdigris R Near Sycamore	R	SC105	WL, MG	5	Bio	2023
VE	11070104	Elk R	Elk City Lake	L	LM025001	EK, MG, CQ	4a	EU	Medium
VE	11070104	Elk R	Elk City Lake	L	LM025001	EK, MG, CQ	4a	Silt	Medium
VE	11070104	Elk R	Elk R Near Howard	R	SC693	EK, MG	4a	FCB	Medium

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
VE	11070104	Elk R	Polk Daniels Lake (Elk Co. SFL)	L	LM012701	EK	5	EU	2023
VE	11070106	Caney R	Little Caney R Near Caney	R	SC572	MG, CQ	5	NO23	2023
VE	11070106	Caney R	Middle Caney Cr Near Sedan	R	SC694	CQ	5	DO	2023
VE	11070106	Caney R	Sedan City North Lake	L	LM048601	CQ	5	EU	2023
WA	11030017	Upper Walnut R	Augusta City Lake	L	LM040001	BU	4a	EU	High
WA	11030017	Upper Walnut R	Augusta Santa Fe Lake	L	LM041601	BU	5	Pb	2023
WA	11030017	Upper Walnut R	Augusta Santa Fe Lake	L	LM041601	BU	4a	DO	Medium
WA	11030017	Upper Walnut R	Augusta Santa Fe Lake	L	LM041601	BU	4a	EU	Medium
WA	11030017	Upper Walnut R	Augusta Santa Fe Lake	L	LM041601	BU	4a	Silt	Medium
WA	11030017	Upper Walnut R	El Dorado Lake	L	LM033001	BU	4a	EU	High
WA	11030017	Upper Walnut R	El Dorado Lake	L	LM033001	BU	4a	Silt	High
WA	11030017	Upper Walnut R	Harvey Co. East Lake	L	LM052001	HV	3	Atr	
WA	11030017	Upper Walnut R	Harvey Co. East Lake	L	LM052001	HV	4a	EU	Medium
WA	11030017	Upper Walnut R	Walnut R Near El Dorado	R	SC279	BU	3	Bio	New
WA	11030017	Upper Walnut R	Walnut R Near El Dorado	R	SC279	BU	5	Se	2023
WA	11030017	Upper Walnut R	Walnut R Near El Dorado	R	SC279	BU	4a	DO	High
WA	11030017	Upper Walnut R	Walnut R Near El Dorado	R	SC279	BU	4a	ECB	High
WA	11030017	Upper Walnut R	Walnut R Near El Dorado	R	SC279	BU	4a	TP	High
WA	11030017	Upper Walnut R	Whitewater R At Towanda	R	SC038	HV, BU, SG	3	Bio	New
WA	11030017	Upper Walnut R	Whitewater R At Towanda	R	SC038	HV, BU, SG	5	Ars	2023
WA	11030017	Upper Walnut R	Whitewater R At Towanda	R	SC038	HV, BU, SG	4a	ECB	High
WA	11030017	Upper Walnut R	Whitewater R At Towanda	R	SC038	HV, BU, SG	4a	TP	High
WA	11030018	Lower Walnut R	Butler Co. SFL	L	LM049401	BU	4a	EU	Medium
WA	11030018	Lower Walnut R	Eight Mile Cr Near Douglas	R	SC704	BU	3	ECB	
WA	11030018	Lower Walnut R	Eight Mile Cr Near Douglas	R	SC704	BU	5	Atr	2023
WA	11030018	Lower Walnut R	Eight Mile Cr Near Douglas	R	SC704	BU	4a	DO	High
WA	11030018	Lower Walnut R	Eight Mile Cr Near Douglas	R	SC704	BU	4a	SO4	Low
WA	11030018	Lower Walnut R	Eight Mile Cr Near Douglas	R	SC704	BU	4a	TP	High
WA	11030018	Lower Walnut R	Four Mile Cr Near Gordon	R	SC744	BU, SG	4a	SO4	Low

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Cate-gory	Impair-ment	Priority
WA	11030018	Lower Walnut R	Four Mile Cr Near Gordon	R	SC744	BU, SG	4a	TP	High
WA	11030018	Lower Walnut R	Little Walnut R Near Douglas	R	SC655	BU	4a	ECB	High
WA	11030018	Lower Walnut R	Rock Cr Near Rock	R	SC654	BU, CL	4a	ECB	High
WA	11030018	Lower Walnut R	Timber Cr Near Winfield	R	SC653	CL	3	ECB	
WA	11030018	Lower Walnut R	Walnut R At Gordon	R	SC106	BU	4a	Bio	Medium
WA	11030018	Lower Walnut R	Walnut R At Gordon	R	SC106	BU	4a	SO4	Low
WA	11030018	Lower Walnut R	Walnut R At Gordon	R	SC106	BU	4a	TP	High
WA	11030018	Lower Walnut R	Walnut R Near Hackney	R	SC532	BU, CL	3	ECB	
WA	11030018	Lower Walnut R	Walnut R Near Hackney	R	SC532	BU, CL	4a	Bio	Medium
WA	11030018	Lower Walnut R	Winfield City Lake	L	LM050801	CL	4a	EU	High
WA	11030018	Lower Walnut R	Winfield Park Lagoon	L	LM072301	CL	4a	EU	Low

APPENDIX B-2: PREVIOUSLY IMPAIRED WATERS, NOW IN CATEGORY 2

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Former Impair-ment
CI	11040002	Upper Cimarron	Cimarron Lake (Moss Lake Middle)	L	LM060401	MT	EU
CI	11040007	Crooked Cr	Crooked Cr	F	NPDES22802	ME	NH3
CI	11040008	Upper Cimarron-Bluff	Cimarron R Near Protection	R	SC592	ME, CA	SO4
CI	11040008	Upper Cimarron-Bluff	Cimarron R Near Protection	R	SC592	ME, CA	Temp
CI	11040008	Upper Cimarron-Bluff	Bluff Cr Near Protection	R	SC593	CA, CM	SO4
CI	11040008	Upper Cimarron-Bluff	Bluff Cr Near Protection	R	SC593	CA, CM	Temp
CI	11040008	Upper Cimarron-Bluff	Day Cr Near Sitka	R	SC701	CA, CM	SO4
KR	10270103	Delaware	Banner Cr Lake	L	LM032001	JA	EU
KR	10270104	Lower Kansas	Gardner City Lake	L	LM040401	JO	Cu
KR	10270102	Middle Kansas	Wabaunsee Co. Lake	L	LM042001	WB	EU
KR	10270104	Lower Kansas	Lake Dabanawa	L	LM054001	JF	EU
KR	10270104	Lower Kansas	Potter's Lake	L	LM073401	DG	pH
KR	10270205	Lower Big Blue	Centralia Lake	L	LM073701	NM	Atr

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Former Impair-ment
KR	10270103	Delaware	Banner Cr	F	NPDES03271	JA	NH3
KR	10270102	Middle Kansas	Doyle Cr	F	NPDES20974	PT	NH3
KR	10270102	Middle Kansas	Doyle Cr	F	NPDES20974	PT	FCB
KR	10270103	Delaware	Upper Delaware R (Cedar Cr)	F	NPDES24724	NM	NH3
KR	10270103	Delaware	Upper Delaware R (Cedar Cr)	F	NPDES24724	NM	DO
KR	10270103	Delaware	Upper Delaware R (Cedar Cr)	F	NPDES24724	NM	FCB
KR	10250017	Lower Republican	Salt Cr	F	NPDES27529	RP	NH3
KR	10250017	Lower Republican	Republican R below Milford Dam	F	NPDES34011	GE	NH3
KR	10250017	Lower Republican	Republican R below Milford Dam	F	NPDES34011	GE	FCB
KR	10270104	Lower Kansas	Kansas R at Lawrence	F	NPDES38644	DG	NH3
KR	10270104	Lower Kansas	Hog Cr	F	NPDES94382	LV	NH3
KR	10270104	Lower Kansas	Upper Wakarusa R	F	NPDES94650	SN	NH3
KR	10250017	Lower Republican	Buffalo Cr	F	NPDES95231	JW	NH3
KR	10270104	Lower Kansas	Kansas R At Kansas City, Kansas	R	SC203	LV, WY, JO	Chl
KR	10270104	Lower Kansas	Kansas R At Kansas City, Kansas	R	SC203	LV, WY, JO	Cu
KR	10270104	Lower Kansas	Kansas R At Kansas City, Kansas	R	SC203	LV, WY, JO	Pb
KR	10250016	Middle Republican	Republican R Near Hardy, Nebraska	R	SC231	JW, SM	pH
KR	10270207	Lower Little Blue	Little Blue R Near Hollenberg	R	SC232	RP, WS	Pb
KR	10270205	Lower Big Blue	Big Blue R Near Oketo	R	SC233	MS	Cu
KR	10270205	Lower Big Blue	Big Blue R Near Oketo	R	SC233	MS	Pb
KR	10270102	Middle Kansas	Shunganunga Cr Near Topeka	R	SC238	SN	DO
KR	10270102	Middle Kansas	Soldier Cr Near Topeka	R	SC239	JA, SN	Bio
KR	10270205	Lower Big Blue	Big Blue R Near Blue Rapids	R	SC240	MS	Be
KR	10270205	Lower Big Blue	Big Blue R Near Blue Rapids	R	SC240	MS	Pb
KR	10270104	Lower Kansas	Mill Cr Near Shawnee	R	SC251	JO	Zn
KR	10270104	Lower Kansas	Kill Cr At Desoto	R	SC253	JO	Chl
KR	10270104	Lower Kansas	Kill Cr At Desoto	R	SC253	JO	Cu
KR	10270104	Lower Kansas	Kansas R At Desoto	R	SC254	LV, JO	Chl
KR	10270104	Lower Kansas	Kansas R At Desoto	R	SC254	LV, JO	Cu
KR	10270104	Lower Kansas	Kansas R At Desoto	R	SC254	LV, JO	Pb

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Former Impair-ment
KR	10270104	Lower Kansas	Kansas R At Eudora	R	SC255	JF, LV, DG	Chl
KR	10270104	Lower Kansas	Kansas R At Eudora	R	SC255	JF, LV, DG	Cu
KR	10270104	Lower Kansas	Kansas R At Eudora	R	SC255	JF, LV, DG	Pb
KR	10270104	Lower Kansas	Kansas R At Eudora	R	SC255	JF, LV, DG	Hg
KR	10270104	Lower Kansas	Kansas R At Lecompton	R	SC257	JF, SN, DG	NH3
KR	10270104	Lower Kansas	Kansas R At Lecompton	R	SC257	JF, SN, DG	Be
KR	10270104	Lower Kansas	Kansas R At Lecompton	R	SC257	JF, SN, DG	Pb
KR	10270104	Lower Kansas	Kansas R At Lecompton	R	SC257	JF, SN, DG	Hg
KR	10270102	Middle Kansas	Kansas R At Willard	R	SC259	PT, SN, WB	Cu
KR	10270102	Middle Kansas	Kansas R At Willard	R	SC259	PT, SN, WB	Pb
KR	10270102	Middle Kansas	Kansas R At Willard	R	SC259	PT, SN, WB	Zn
KR	10270102	Middle Kansas	Kansas R At Wamego	R	SC260	Rl, PT, WB	Zn
KR	10270104	Lower Kansas	Stranger Cr Near Linwood	R	SC501	LV	Be
KR	10270104	Lower Kansas	Stranger Cr Near Linwood	R	SC501	LV	Cu
KR	10250017	Lower Republican	Republican R Near Clay Center	R	SC503	CY	Pb
KR	10250017	Lower Republican	Republican R Near Clay Center	R	SC504	RP, WS, CD, CY	Pb
KR	10270205	Lower Big Blue	Black Vermillion R Near Frankfort	R	SC505	MS,NM	Cu
KR	10270205	Lower Big Blue	Black Vermillion R Near Frankfort	R	SC505	MS,NM	Pb
KR	10270102	Middle Kansas	West Branch Mill Cr Near Alma	R	SC506	GE, WB	FCB
KR	10270207	Lower Little Blue	Mill Cr Near Hanover	R	SC507	RP, WS	Cu
KR	10270207	Lower Little Blue	Mill Cr Near Hanover	R	SC507	RP, WS	Pb
KR	10250017	Lower Republican	Buffalo Cr Near Concordia	R	SC509	JW, CD	Cl
KR	10250017	Lower Republican	Republican R Near Rice	R	SC510	JW, RP, CD	pH
KR	10270101	Upper Kansas	Clarks Cr Near Grandview Plaza	R	SC517	GE, MR	Bio
KR	10270101	Upper Kansas	Clarks Cr Near Grandview Plaza	R	SC517	GE, MR	FCB
KR	10270101	Upper Kansas	Kansas R Near Ogden	R	SC518	RL, GE	Cl
KR	10270102	Middle Kansas	Mill Cr Near Maple Hill	R	SC521	WB	FCB
KR	10270103	Delaware	Grasshopper Cr Near Muscotah	R	SC603	BR, AT	Cu
KR	10270103	Delaware	Grasshopper Cr Near Muscotah	R	SC603	BR, AT	Zn

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Former Impair-ment
KR	10270103	Delaware	Elk Cr Near Larkinburg	R	SC604	JA, PT	NH3
KR	10270104	Lower Kansas	Captain Cr Near Eudora	R	SC638	DG, JO	Cu
KR	10270104	Lower Kansas	Captain Cr Near Eudora	R	SC638	DG, JO	Pb
KR	10270102	Middle Kansas	Muddy Cr Near Grantville	R	SC639	JA, JF, SN	Cu
KR	10270102	Middle Kansas	Mission Cr Near Valencia	R	SC648	SN, WB	Cu
KR	10250017	Lower Republican	Peats Cr Near Clifton	R	SC649	WS	Atr
KR	10250017	Lower Republican	Peats Cr Near Clifton	R	SC649	WS	FCB
KR	10250017	Lower Republican	Peats Cr Near Clifton	R	SC649	WS	Pb
KR	10270104	Lower Kansas	Nine Mile Cr Near Linwood	R	SC680	JF, LV, DG	TP
KR	10270104	Lower Kansas	Nine Mile Cr Near Linwood	R	SC680	JF, LV, DG	Zn
KR	10250017	Lower Republican	Elm Cr Near Ames	R	SC709	CD	Pb
KR	10250017	Lower Republican	Mulberry Cr Near Clifton	R	SC710	CD, CY	Pb
KR	10250017	Lower Republican	Mulberry Cr Near Clifton	R	SC710	CD, CY	Zn
KR	10270207	Lower Little Blue	Rose Cr Near Narka	R	SC712	RP	Cu
KR	10270207	Lower Little Blue	Rose Cr Near Narka	R	SC712	RP	Pb
KR	10270207	Lower Little Blue	Rose Cr Near Narka	R	SC712	RP	TSS
KR	10270205	Lower Big Blue	Horseshoe Cr Near Marysville	R	SC717	MR, CS	Cu
KR	10270205	Lower Big Blue	Horseshoe Cr Near Marysville	R	SC717	MR, CS	Pb
KR	10270205	Lower Big Blue	Horseshoe Cr Near Marysville	R	SC717	MR, CS	TSS
KR	10270102	Middle Kansas	Illinois Cr Near Alma	R	SC726	WB	FCB
KR	10270207	Lower Little Blue	Little Blue R Near Waterville	R	SC741	WS, MS	Cu
KR	10270207	Lower Little Blue	Little Blue R Near Waterville	R	SC741	WS, MS	Pb
LA	11030015	South Fork Ninnescah	Kingman W.A.	L	LM010441	KM	EU
LA	11030015	South Fork Ninnescah	Kingman W.A.	L	LM010441	KM	Silt
LA	11030013	Middle Arkansas-Slate	Slate Cr W.A.	L	LM014201	SU	B
LA	11030013	Middle Arkansas-Slate	Slate Cr W.A.	L	LM014201	SU	F
LA	11060005	Chikaskia	Wellington Lake	L	LM042201	SU	EU
LA	11030012	Little Arkansas	Inman Lake	L	LM050301	MP	EU
LA	11030011	Cow Cr	Cheyenne Bottoms	L	LM050401	BT	Cl
LA	11030011	Cow Cr	Cheyenne Bottoms	L	LM050401	BT	SO4

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Former Impair-ment
LA	11030015	South Fork Ninnescah	Texas Lake W.A.	L	LM053001	PR	EU
LA	11030015	South Fork Ninnescah	Texas Lake W.A.	L	LM053001	PR	pH
LA	11030015	South Fork Ninnescah	Texas Lake W.A.	L	LM053001	PR	Silt
LA	11060005	Chikaskia	Sandy Cr	F	NPDES30643	KM	NH3
LA	11060005	Chikaskia	Sandy Cr	F	NPDES30643	KM	DO
LA	11060005	Chikaskia	Sandy Cr	F	NPDES30643	KM	FCB
LA	11030013	Middle Arkansas-Slate	Arkansas R below Arkansas City	F	NPDES44831	CL	FCB
LA	11030015	South Fork Ninnescah	Ninnescah R, South Fork	F	NPDES49751	PR	NH3
LA	11030009	Rattlesnake	Rattlesnake Cr Near Raymond	R	SC030	SF	Cl
LA	11030009	Rattlesnake	Rattlesnake Cr Near Raymond	R	SC030	SF	SO4
LA	11030015	South Fork Ninnescah	South Fork Ninnescah R Near Murdock	R	SC036	PR, KM	pH
LA	11030013	Middle Arkansas-Slate	Arkansas R Near Arkansas City	R	SC218	SU, CL	Pb
LA	11030013	Middle Arkansas-Slate	Arkansas R Near Arkansas City	R	SC218	SU, CL	SO4
LA	11060003	Medicine Lodge	Medicine Lodge R Near Kiowa	R	SC220	BA	SO4
LA	11060003	Medicine Lodge	Medicine Lodge R Near Kiowa	R	SC220	BA	Temp
LA	11030012	Little Arkansas	Little Arkansas R At Alta Mills	R	SC246	MP, RC, RN	NH3
LA	11030012	Little Arkansas	Little Arkansas R At Alta Mills	R	SC246	MP, RC, RN	Cu
LA	11030012	Little Arkansas	Little Arkansas R At Alta Mills	R	SC246	MP, RC, RN	F
LA	11030012	Little Arkansas	Little Arkansas R At Alta Mills	R	SC246	MP, RC, RN	Pb
LA	11030016	Ninnescah	Ninnescah R Near Belle Plaine	R	SC280	SG, KM, SU	TSS
LA	11030013	Middle Arkansas-Slate	Arkansas R At Derby	R	SC281	SG	Atr
LA	11030013	Middle Arkansas-Slate	Arkansas R At Derby	R	SC281	SG	Chl
LA	11030013	Middle Arkansas-Slate	Arkansas R At Derby	R	SC281	SG	Pb
LA	11030013	Middle Arkansas-Slate	Arkansas R At Derby	R	SC281	SG	SO4
LA	11030013	Middle Arkansas-Slate	Arkansas R At Derby	R	SC281	SG	TSS
LA	11030012	Little Arkansas	Little Arkansas R At Valley Center	R	SC282	HV, SG	Chl
LA	11030012	Little Arkansas	Little Arkansas R At Valley Center	R	SC282	HV, SG	Cu
LA	11030012	Little Arkansas	Little Arkansas R At Valley Center	R	SC282	HV, SG	Pb
LA	11030011	Cow Cr	Cow Cr Near Hutchinson	R	SC287	RN	Chl

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Former Impair-ment
LA	11030013	Middle Arkansas-Slate	Cowskin Cr In Wichita-Valley Center Floodway	R	SC288	SG	Chl
LA	11030013	Middle Arkansas-Slate	Cowskin Cr In Wichita-Valley Center Floodway	R	SC288	SG	Cu
LA	11030013	Middle Arkansas-Slate	Cowskin Cr In Wichita-Valley Center Floodway	R	SC288	SG	Pb
LA	11030013	Middle Arkansas-Slate	Cowskin Cr In Wichita-Valley Center Floodway	R	SC288	SG	pH
LA	11030011	Cow Cr	Cow Cr Near Willowbrook	R	SC522	RC, RN	Chl
LA	11030011	Cow Cr	Cow Cr Near Willowbrook	R	SC522	RC, RN	DO
LA	11030011	Cow Cr	Cow Cr Near Willowbrook	R	SC522	RC, RN	Pb
LA	11030011	Cow Cr	Cow Cr Near Willowbrook	R	SC522	RC, RN	Zn
LA	11030010	Gar-Peace	Arkansas R Near Hutchinson	R	SC523	RC, RN	pH
LA	11030010	Gar-Peace	Arkansas R Near Hutchinson	R	SC523	RC, RN	SO4
LA	11030010	Gar-Peace	Arkansas R Near Yoder	R	SC524	RN	Chl
LA	11030010	Gar-Peace	Arkansas R Near Yoder	R	SC524	RN	pH
LA	11030010	Gar-Peace	Arkansas R Near Yoder	R	SC524	RN	SO4
LA	11030014	North Fork Ninnescah	North Fork Ninnescah R Near Castleton	R	SC525	SF, RN, PR	Atr
LA	11030014	North Fork Ninnescah	North Fork Ninnescah R Near Castleton	R	SC525	SF, RN, PR	B
LA	11030014	North Fork Ninnescah	North Fork Ninnescah R Near Castleton	R	SC525	SF, RN, PR	FCB
LA	11030013	Middle Arkansas-Slate	Arkansas R At Oxford	R	SC527	SG, SU, CL	Chl
LA	11030013	Middle Arkansas-Slate	Arkansas R At Oxford	R	SC527	SG, SU, CL	Pb
LA	11030013	Middle Arkansas-Slate	Arkansas R At Oxford	R	SC527	SG, SU, CL	SO4
LA	11030013	Middle Arkansas-Slate	Slate Cr Near Wellington	R	SC528	SU	Cl
LA	11030013	Middle Arkansas-Slate	Slate Cr Near Wellington	R	SC528	SU	Pb
LA	11060005	Chikaskia	Chikaskia R Near Corbin	R	SC529	SU	Be
LA	11060005	Chikaskia	Chikaskia R Near Corbin	R	SC529	SU	Cu

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Former Impair-ment
LA	11060005	Chikaskia	Chikaskia R Near Corbin	R	SC529	SU	Pb
LA	11060005	Chikaskia	Bluff Cr Near Caldwell	R	SC530	HP	DO
LA	11060005	Chikaskia	Bluff Cr Near Caldwell	R	SC530	HP	Pb
LA	11060005	Chikaskia	Bluff Cr Near Caldwell	R	SC530	HP	Se
LA	11030012	Little Arkansas	Turkey Cr Near Alta Mills	R	SC533	MP, RC, RN	F
LA	11030012	Little Arkansas	Turkey Cr Near Alta Mills	R	SC533	MP, RC, RN	Pb
LA	11030012	Little Arkansas	Turkey Cr Near Alta Mills	R	SC533	MP, RC, RN	Zn
LA	11030012	Little Arkansas	Emma Cr Near Sedgwick	R	SC534	MP, MN, HV	Cu
LA	11030012	Little Arkansas	Emma Cr Near Sedgwick	R	SC534	MP, MN, HV	Pb
LA	11030010	Gar-Peace	Arkansas R Near Maize	R	SC536	RN, SG	Atr
LA	11030010	Gar-Peace	Arkansas R Near Maize	R	SC536	RN, SG	Chl
LA	11030010	Gar-Peace	Arkansas R Near Maize	R	SC536	RN, SG	pH
LA	11030010	Gar-Peace	Arkansas R Near Maize	R	SC536	RN, SG	SO4
LA	11030010	Gar-Peace	Arkansas R Near Maize	R	SC536	RN, SG	TP
LA	11060003	Medicine Lodge	Medicine Lodge R Near Belvidere	R	SC588	KW	SO4
LA	11060003	Medicine Lodge	Medicine Lodge R Near Medicine Lodge	R	SC589	PR, KW, BA	Se
LA	11060003	Medicine Lodge	Elm Cr Near Medicine Lodge	R	SC590	PR, BA	NH3
LA	11060002	Upper Salt Fork Arkansas	Salt Fork Arkansas R Near Hardtner	R	SC591	BA, CM	SO4
LA	11060004	Lower Salt Fork Arkansas	Sandy Cr Near Ruella	R	SC619	HP	FCB
LA	11060004	Lower Salt Fork Arkansas	Little Sandy Cr Near Corwin	R	SC620	BA, HP	FCB
LA	11060003	Medicine Lodge	Little Mule Cr Near Kiowa	R	SC621	BA	SO4
LA	11060002	Upper Salt Fork Arkansas	Mule Cr Near Aetna	R	SC622	KW, BA, CM	SO4
LA	11060002	Upper Salt Fork Arkansas	Mule Cr Near Aetna	R	SC622	KW, BA, CM	Temp
LA	11030011	Cow Cr	Little Cow Cr Near Lyons	R	SC656	EW, RC	NH3
LA	11030011	Cow Cr	Little Cow Cr Near Lyons	R	SC656	EW, RC	Atr

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Former Impair-ment
LA	11030011	Cow Cr	Little Cow Cr Near Lyons	R	SC656	EW, RC	Cu
LA	11030011	Cow Cr	Little Cow Cr Near Lyons	R	SC656	EW, RC	Pb
LA	11030011	Cow Cr	Cow Cr Near Lyons	R	SC657	EW, BT, RC	Atr
LA	11030011	Cow Cr	Cow Cr Near Lyons	R	SC657	EW, BT, RC	DO
LA	11030009	Rattlesnake	Rattlesnake Cr Near Hudson	R	SC660	SF, ED, KW	Cl
LA	11030009	Rattlesnake	Rattlesnake Cr Near Hudson	R	SC660	SF, ED, KW	SO4
LA	11030015	South Fork Ninnescah	Smoots Cr Near Murdock	R	SC661	RN, KM	FCB
LA	11060005	Chikaskia	Fall Cr Near Caldwell	R	SC662	SU	NH3
LA	11030013	Middle Arkansas-Slate	Cowskin Cr Near Belle Plaine	R	SC702	SG, SU	Chl
LA	11030013	Middle Arkansas-Slate	Cowskin Cr Near Belle Plaine	R	SC702	SG, SU	Cu
LA	11030013	Middle Arkansas-Slate	Cowskin Cr Near Belle Plaine	R	SC702	SG, SU	Pb
LA	11030012	Little Arkansas	Kisiwa Cr Near Halstead	R	SC703	HV, RN	Cu
LA	11030012	Little Arkansas	Kisiwa Cr Near Halstead	R	SC703	HV, RN	Pb
LA	11030012	Little Arkansas	Black Kettle Cr Near Halstead	R	SC705	MP, HV	Pb
LA	11060001	Kaw Lake	Silver Cr Near Silverdale	R	SC706	CL	Cu
LA	11030012	Little Arkansas	Little Arkansas R At Wichita	R	SC728	SG, SU	Chl
LA	11030012	Little Arkansas	Little Arkansas R At Wichita	R	SC728	SG, SU	Cu
LA	11030012	Little Arkansas	Little Arkansas R At Wichita	R	SC728	SG, SU	Pb
LA	11030013	Middle Arkansas-Slate	Arkansas R At Wichita	R	SC729	SG, SU	Atr
LA	11030013	Middle Arkansas-Slate	Arkansas R At Wichita	R	SC729	SG, SU	Chl
LA	11030013	Middle Arkansas-Slate	Arkansas R At Wichita	R	SC729	SG, SU	Cu
LA	11030013	Middle Arkansas-Slate	Arkansas R At Wichita	R	SC729	SG, SU	Pb
LA	11030013	Middle Arkansas-Slate	Arkansas R At Wichita	R	SC729	SG, SU	pH
LA	11030013	Middle Arkansas-Slate	Arkansas R At Wichita	R	SC729	SG, SU	SO4
LA	11030013	Middle Arkansas-Slate	Cowskin Cr At Wichita	R	SC730	SG, SU	Atr
LA	11030013	Middle Arkansas-Slate	Cowskin Cr At Wichita	R	SC730	SG, SU	Chl
LA	11030013	Middle Arkansas-Slate	Cowskin Cr At Wichita	R	SC730	SG, SU	Pb
LA	11030013	Middle Arkansas-Slate	Cowskin Cr At Wichita	R	SC730	SG, SU	pH
LA	11030014	North Fork Ninnescah	Red Rock Cr	R	USGS07144730	RN	Atr
MC	10290102	Lower Marais Des Cygnes	Blue Mound City Lake	L	LM046401	LN	EU

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Former Impair-ment
MC	10290102	Lower Marais Des Cygnes	Marais Des Cygnes W.A.	L	LM053201	LN	Zn
MC	10290102	Lower Marais Des Cygnes	Louisburg Old Lake	L	LM065701	MI	EU
MC	10290102	Lower Marais Des Cygnes	Parker City Lake	L	LM066301	LN	EU
MC	10290101	Upper Marais Des Cygnes	Westphalia Lake	L	LM066901	AN	EU
MC	10290101	Upper Marais Des Cygnes	Walnut Cr	F	NPDES24651	FR	NH3
MC	10290101	Upper Marais Des Cygnes	Salt Cr	F	NPDES24821	OS	NH3
MC	10290101	Upper Marais Des Cygnes	Pottawatomie Cr	F	NPDES24830	AN	FCB
MC	10290101	Upper Marais Des Cygnes	Tauy Cr, East Fork	F	NPDES46361	DG	FCB
MC	10290104	Marmaton	Marmaton R	F	NPDES52116	BB	NH3
MC	10290104	Marmaton	Marmaton R	F	NPDES52116	BB	FCB
MC	10290101	Upper Marais Des Cygnes	Pottawatomie Cr, South Fork	F	NPDES96377	AN	FCB
MC	10290101	Upper Marais Des Cygnes	Marais Des Cygnes R	F	NPDES97535	FR	NH3
MC	10290102	Lower Marais Des Cygnes	Marais Des Cygnes Near Trading Post	R	SC206	MI, LN	Cu
MC	10290103	Little Osage	Little Osage R Near Fulton	R	SC207	AN, LN, AL, BB	Cu
MC	10290103	Little Osage	Little Osage R Near Fulton	R	SC207	AN, LN, AL, BB	Pb
MC	10290104	Marmaton	Marmaton R Near Fort Scott	R	SC208	BB	Zn
MC	10290101	Upper Marais Des Cygnes	110 Mile Cr Below Pomona Lake Dam	R	SC244	OS, WB	Cu
MC	10290101	Upper Marais Des Cygnes	110 Mile Cr Below Pomona Lake Dam	R	SC244	OS, WB	FCB
MC	10290101	Upper Marais Des Cygnes	110 Mile Cr Below Pomona Lake Dam	R	SC244	OS, WB	Pb
MC	10290101	Upper Marais Des Cygnes	Marais Des Cygnes R Near Ottawa	R	SC270	DG, FR	Cu
MC	10290101	Upper Marais Des Cygnes	Marais Des Cygnes R Near Ottawa	R	SC270	DG, FR	DO
MC	10290101	Upper Marais Des Cygnes	Marais Des Cygnes R Near Richter	R	SC555	OS, FR	Cu
MC	10290101	Upper Marais Des Cygnes	Marais Des Cygnes R Near Richter	R	SC555	OS, FR	Se
MC	10290101	Upper Marais Des Cygnes	Marais Des Cygnes R Near Richter	R	SC555	OS, FR	Zn
MC	10290102	Lower Marais Des Cygnes	Bull Cr Near Henson	R	SC557	MI	Zn
MC	10290101	Upper Marais Des Cygnes	Dragoon Cr Near Burlingame	R	SC577	WB, OS	DO
MC	10290101	Upper Marais Des Cygnes	One Hundred Forty Two Mile Cr Near Reading	R	SC579	LY	Atr

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Former Impair-ment
MC	10290101	Upper Marais Des Cygnes	One Hundred Forty Two Mile Cr Near Reading	R	SC579	LY	Cu
MC	10290101	Upper Marais Des Cygnes	One Hundred Forty Two Mile Cr Near Reading	R	SC579	LY	Zn
MC	10290101	Upper Marais Des Cygnes	Ottawa Cr Near Ottawa	R	SC616	DG, FR	Cu
MC	10290101	Upper Marais Des Cygnes	110 Mile Cr Near Scranton	R	SC633	OS, FR	Zn
MC	10290101	Upper Marais Des Cygnes	Switzler Cr Near Burlingame	R	SC687	OS	Pb
MC	10290101	Upper Marais Des Cygnes	Switzler Cr Near Burlingame	R	SC687	OS	Se
MC	10290101	Upper Marais Des Cygnes	Switzler Cr Near Burlingame	R	SC687	OS	Zn
MC	10290102	Lower Marais Des Cygnes	Middle Cr Near New Lancaster	R	SC697	MI	Zn
MC	10290101	Upper Marais Des Cygnes	Marais Des Cygnes R Near Quenemo	R	SC720	OS, CF	Cu
MC	10290101	Upper Marais Des Cygnes	Marais Des Cygnes R Near Quenemo	R	SC720	OS, CF	Se
MC	10290101	Upper Marais Des Cygnes	Marais Des Cygnes R Near Quenemo	R	SC720	OS, CF	TSS
MC	10290101	Upper Marais Des Cygnes	Marais Des Cygnes R Near Reading	R	SC742	WB, LY	DO
MC	10290102	Lower Marais Des Cygnes	Marais Des Cygnes R Near Henson	R	SC743	FR, MI	Pb
MO	10240005	Tarkio-Wolf	Wolf R, North Fork	F	NPDES23698	BR	NH3
MO	10240005	Tarkio-Wolf	Wolf R, North Fork	F	NPDES23698	BR	DO
MO	10240011	Independence-Sugar	Whiskey Cr	F	NPDES39128	AT	NH3
MO	10240007	South Fork Big Nemaha	Big Nemaha R, South Fork	F	NPDES47538	NM	DO
MO	10240005	Tarkio-Wolf	Wolf R	F	NPDES80667	BR	NH3
MO	10240005	Tarkio-Wolf	Wolf R	F	NPDES80667	BR	DO
MO	10300101	Lower Missouri-Crooked	Blue R Near Stanley	R	SC205	JO	Chl
MO	10240008	Big Nemaha	Roys Cr Near Reserve	R	SC552	BR, DP	Cu
MO	10240008	Big Nemaha	Roys Cr Near Reserve	R	SC552	BR, DP	Zn
MO	10240011	Independence-Sugar	Independence Cr Near Atchison	R	SC553	DP, AT	Cu
MO	10240007	South Fork Big Nemaha	Turkey Cr Near Bern	R	SC601	MS, NM	Cu
NE	11070205	Middle Neosho	Mined Land Lake 12	L	LM035901	CK	pH
NE	11070205	Middle Neosho	Mined Land Lake 12	L	LM035901	CK	Silt
NE	11070205	Middle Neosho	Mined Land Lake 22	L	LM036801	CK	Perch
NE	11070205	Middle Neosho	Mined Land Lake 30	L	LM037601	CK	Silt

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Former Impair-ment
NE	11070201	Neosho Headwaters	Lake Kahola	L	LM043401	MR	Silt
NE	11070204	Upper Neosho	Gridley City Lake	L	LM045601	CF	Be
NE	11070205	Middle Neosho	Mined Land Lake 17	L	LM048201	CK	Silt
NE	11070204	Upper Neosho	New Strawn Park Lake	L	LM073101	CF	Silt
NE	11070207	Spring	Empire Lake	L	LM074101	CK	EU
NE	11070207	Spring	Empire Lake	L	LM074101	CK	Silt
NE	11070207	Spring	Cow Cr	F	NPDES38954	CR	FCB
NE	11070203	Lower Cottonwood	Cottonwood R	F	NPDES46728	LY	FCB
NE	11070202	Upper Cottonwood	Doyle Cr	F	NPDES51705	MN	NH3
NE	11070202	Upper Cottonwood	Doyle Cr	F	NPDES51705	MN	DO
NE	11070202	Upper Cottonwood	Doyle Cr	F	NPDES51705	MN	FCB
NE	11070204	Upper Neosho	Little Turkey Cr	F	NPDES80837	NO	NH3
NE	11070204	Upper Neosho	Little Turkey Cr	F	NPDES80837	NO	FCB
NE	11070204	Upper Neosho	Owl Cr	F	NPDES97446	WO	NH3
NE	11070205	Middle Neosho	Labette Cr	F	NPDES97560	LB	NH3
NE	11070205	Middle Neosho	Labette Cr	F	NPDES97560	LB	FCB
NE	11070206	Lake O' The Cherokees	Tar Cr At Pitcher, Oklahoma	R	SC110	CK	SO4
NE	11070204	Upper Neosho	Neosho R Near Chanute	R	SC271	WL, NO	Cu
NE	11070204	Upper Neosho	Neosho R Near Chanute	R	SC271	WL, NO	pH
NE	11070204	Upper Neosho	Neosho R Near Chanute	R	SC271	WL, NO	Zn
NE	11070203	Lower Cottonwood	Cottonwood R Near Emporia	R	SC274	LY, CS	Bio
NE	11070203	Lower Cottonwood	Cottonwood R Near Emporia	R	SC274	LY, CS	Chl
NE	11070203	Lower Cottonwood	Cottonwood R Near Emporia	R	SC274	LY, CS	ECB
NE	11070203	Lower Cottonwood	Cottonwood R Near Plymouth	R	SC275	CS	ECB
NE	11070203	Lower Cottonwood	Cottonwood R Near Plymouth	R	SC275	CS	SO4
NE	11070204	Upper Neosho	Neosho R Near Chanute	R	SC560	CF, AN, WO, AL	Cu
NE	11070204	Upper Neosho	Neosho R Near Chanute	R	SC560	CF, AN, WO, AL	ECB

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Former Impair-ment
NE	11070204	Upper Neosho	Neosho R Near Chanute	R	SC560	CF, AN, WO, AL	Pb
NE	11070204	Upper Neosho	Neosho R Near Chanute	R	SC560	CF, AN, WO, AL	pH
NE	11070204	Upper Neosho	Neosho R Near Chanute	R	SC560	CF, AN, WO, AL	Zn
NE	11070205	Middle Neosho	Labette Cr Near Labette	R	SC564	NO, LB	Cu
NE	11070205	Middle Neosho	Labette Cr Near Labette	R	SC564	NO, LB	Zn
NE	11070205	Middle Neosho	Lightning Cr Near Oswego	R	SC565	CR, CK	Temp
NE	11070205	Middle Neosho	Neosho R Near Oswego	R	SC566	NO, CR, LB	pH
NE	11070207	Spring	Cow Cr Near Lawton	R	SC567	CR, CK	Chl
NE	11070207	Spring	Cow Cr Near Lawton	R	SC567	CR, CK	DO
NE	11070207	Spring	Shawnee Cr Near Crestline	R	SC569	CK	ECB
NE	11070207	Spring	Shawnee Cr Near Crestline	R	SC569	CK	FCB
NE	11070205	Middle Neosho	Labette Cr Near Chetopa	R	SC571	LB	Atr
NE	11070205	Middle Neosho	Labette Cr Near Chetopa	R	SC571	LB	Cu
NE	11070205	Middle Neosho	Labette Cr Near Chetopa	R	SC571	LB	DO
NE	11070205	Middle Neosho	Labette Cr Near Chetopa	R	SC571	LB	Pb
NE	11070201	Neosho Headwaters	Neosho R Near Emporia	R	SC580	LY	DO
NE	11070202	Upper Cottonwood	Cedar Cr Near Cedar Point	R	SC583	MN, CS	Cu
NE	11070202	Upper Cottonwood	Cedar Cr Near Cedar Point	R	SC583	MN, CS	Zn
NE	11070205	Middle Neosho	Cherry Cr Near Faulkner	R	SC605	CK	Atr
NE	11070205	Middle Neosho	Cherry Cr Near Faulkner	R	SC605	CK	Pb
NE	11070204	Upper Neosho	Deer Cr Near Iola	R	SC609	AN, AL	Zn
NE	11070204	Upper Neosho	Owl Cr Near Humboldt	R	SC610	WO, WL	ECB
NE	11070204	Upper Neosho	Owl Cr Near Humboldt	R	SC610	WO, WL	Pb
NE	11070204	Upper Neosho	Owl Cr Near Humboldt	R	SC610	WO, WL	Zn
NE	11070204	Upper Neosho	Big Cr Near Chanute	R	SC611	AL, NO	Cu
NE	11070205	Middle Neosho	Canville Cr Near Shaw	R	SC612	AL, NO	Cu
NE	11070205	Middle Neosho	Flat Rock Cr Near St. Paul	R	SC613	BB, NO, CR	Cu

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Former Impair-ment
NE	11070204	Upper Neosho	Turkey Cr Near Le Roy	R	SC614	CF, WO	Cu
NE	11070204	Upper Neosho	Turkey Cr Near Le Roy	R	SC614	CF, WO	DO
NE	11070204	Upper Neosho	Turkey Cr Near Le Roy	R	SC614	CF, WO	Pb
NE	11070204	Upper Neosho	Turkey Cr Near Le Roy	R	SC614	CF, WO	Zn
NE	11070204	Upper Neosho	Big Cr Near Le Roy	R	SC615	CF	Cu
NE	11070204	Upper Neosho	Big Cr Near Le Roy	R	SC615	CF	ECB
NE	11070203	Lower Cottonwood	Middle Cr Near Elmdale	R	SC626	MN, CS	Pb
NE	11070203	Lower Cottonwood	Cottonwood R Near Elmdale	R	SC627	MN, CS	ECB
NE	11070201	Neosho Headwaters	Allen Cr Near Emporia	R	SC628	LY	Cu
NE	11070201	Neosho Headwaters	Allen Cr Near Emporia	R	SC628	LY	ECB
NE	11070201	Neosho Headwaters	Rock Cr Near Dunlap	R	SC629	WB, MR, LY	DO
NE	11070201	Neosho Headwaters	Rock Cr Near Dunlap	R	SC629	WB, MR, LY	FCB
NE	11070201	Neosho Headwaters	Four Mile Cr Near Council Grove	R	SC630	MR	Atr
NE	11070201	Neosho Headwaters	Four Mile Cr Near Council Grove	R	SC630	MR	FCB
NE	11070201	Neosho Headwaters	Four Mile Cr Near Council Grove	R	SC630	MR	Zn
NE	11070201	Neosho Headwaters	Munkers Cr Near Council Grove	R	SC631	WB, MR, LY	Cu
NE	11070201	Neosho Headwaters	Lairds Cr Near Kelso	R	SC632	MR	Zn
NE	11070201	Neosho Headwaters	Eagle Cr Near Olpe	R	SC634	LY	Cu
NE	11070202	Upper Cottonwood	South Cottonwood R Near Canada	R	SC635	MN, CS	ECB
NE	11070202	Upper Cottonwood	South Cottonwood R Near Canada	R	SC635	MN, CS	Hg
NE	11070202	Upper Cottonwood	South Cottonwood R Near Canada	R	SC635	MN, CS	SO4
NE	11070202	Upper Cottonwood	North Cottonwood R Near Durham	R	SC636	MP, MN, HV	Cu
NE	11070202	Upper Cottonwood	North Cottonwood R Near Durham	R	SC636	MP, MN, HV	Zn
NE	11070201	Neosho Headwaters	Neosho R Near Parkerville	R	SC637	MR	ECB
NE	11070201	Neosho Headwaters	Neosho R At Parkerville	R	SC675	MR	Cu
NE	11070202	Upper Cottonwood	French Cr Near Hillsboro	R	SC676	MN	SO4
NE	11070203	Lower Cottonwood	Palmer Cr Near Strong City	R	SC719	CS	DO
NE	11070201	Neosho Headwaters	Eagle Cr Near Hartford	R	SC740	LY	Cu

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Former Impair-ment
NE	11070201	Neosho Headwaters	Eagle Cr Near Hartford	R	SC740	LY	DO
SO	10260014	Lower South Fork Solomon	Rooks Co. SFL	L	LM011901	RO	AP
SO	10260013	Upper South Fork Solomon	Webster Lake	L	LM012001	RO	Cl
SO	10260013	Upper South Fork Solomon	Sheridan Co. SFL	L	LM069401	SD	AP
SO	10260015	Solomon R	Solomon R At Niles	R	SC266	CD, OT, SA	ECB
SO	10260015	Solomon R	Solomon R At Niles	R	SC266	CD, OT, SA	Zn
SO	10260015	Solomon R	Solomon R Near Glasco	R	SC511	JW, CD, MC	FCB
SO	10260015	Solomon R	Salt Cr Near Minneapolis	R	SC512	MC, OT, LC	FCB
SO	10260014	Lower South Fork Solomon	South Fork Solomon R Near Osborne	R	SC542	OB, RO, RS	FCB
SO	10260012	Lower North Fork Solomon	Oak Cr Near Cawker City	R	SC544	JW, SM	FCB
SO	10260011	Upper North Fork Solomon	Bow Cr Near Stockton	R	SC545	PL, RO, SD, GH	ECB
SO	10260011	Upper North Fork Solomon	Bow Cr Near Stockton	R	SC545	PL, RO, SD, GH	FCB
SO	10260011	Upper North Fork Solomon	Bow Cr Near Stockton	R	SC545	PL, RO, SD, GH	TSS
SO	10260011	Upper North Fork Solomon	North Fork Solomon R Near Glade	R	SC546	PL, NT, TH, SD	TSS
SO	10260015	Solomon R	Pipe Cr Near Minneapolis	R	SC651	CD, OT, SA	Cu
SO	10260015	Solomon R	Pipe Cr Near Minneapolis	R	SC651	CD, OT, SA	FCB
SO	10260015	Solomon R	Pipe Cr Near Minneapolis	R	SC651	CD, OT, SA	Zn
SO	10260015	Solomon R	Limestone Cr Near Glen Elder	R	SC667	JW	ECB
SO	10260015	Solomon R	Limestone Cr Near Glen Elder	R	SC667	JW	TSS
SO	10260014	Lower South Fork Solomon	Twin Cr Near Corinth	R	SC668	OB	ECB
SO	10260014	Lower South Fork Solomon	Twin Cr Near Corinth	R	SC668	OB	FCB
SO	10260014	Lower South Fork Solomon	Carr Cr Near Cawker City	R	SC669	OB, MC	ECB
SO	10260014	Lower South Fork Solomon	Carr Cr Near Cawker City	R	SC669	OB, MC	FCB
SO	10260012	Lower North Fork Solomon	Beaver Cr Near Gaylord	R	SC670	SM	ECB
SO	10260012	Lower North Fork Solomon	Beaver Cr Near Gaylord	R	SC670	SM	FCB
SO	10260012	Lower North Fork Solomon	Beaver Cr Near Gaylord	R	SC670	SM	TSS

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Former Impair-ment
SO	10260012	Lower North Fork Solomon	Twelve Mile Cr Near Downs	R	SC674	SM, OB	TSS
SO	10260015	Solomon R	Browns Cr Near Solomon Rapids	R	SC716	WS, MS	DO
SO	10260015	Solomon R	Browns Cr Near Solomon Rapids	R	SC716	WS, MS	FCB
SO	10260012	Lower North Fork Solomon	Deer Cr Near Kirwin	R	SC721	PL	FCB
SS	10260009	Upper Saline	Sheridan W.A.	L	LM014501	SD	DO
SS	10260009	Upper Saline	Sheridan W.A.	L	LM014501	SD	Silt
SS	10260006	Middle Smoky Hill	Smoky Hill R Near Russell	R	SC007	RS, EL, RH	FCB
SS	10260009	Upper Saline	Saline R Near Russell	R	SC011	RO, RS, EL	FCB
SS	10260003	Upper Smoky Hill	Smoky Hill R At Elkader	R	SC224	LG, WA, WH	DO
SS	10260003	Upper Smoky Hill	Smoky Hill R At Elkader	R	SC224	LG, WA, WH	ECB
SS	10260003	Upper Smoky Hill	Smoky Hill R At Elkader	R	SC224	LG, WA, WH	pH
SS	10260008	Lower Smoky Hill	Smoky Hill R At Junction City	R	SC264	GE, DK	Be
SS	10260008	Lower Smoky Hill	Smoky Hill R At Junction City	R	SC264	GE, DK	Pb
SS	10260008	Lower Smoky Hill	Smoky Hill R At Enterprise	R	SC265	DK, SA	ECB
SS	10260010	Lower Saline	Saline R Near Beverly	R	SC513	LC	FCB
SS	10260008	Lower Smoky Hill	Smoky Hill R Near Mentor	R	SC514	SA, EW, MP	SO4
SS	10260008	Lower Smoky Hill	Chapman Cr Near Sutphen	R	SC515	CY, OT, DK	ECB
SS	10260008	Lower Smoky Hill	Lyon Cr Near Wreford	R	SC516	GE, CK, MR, MN	FCB
SS	10260008	Lower Smoky Hill	Lyon Cr Near Wreford	R	SC516	GE, CK, MR, MN	TP
SS	10260007	Big Cr	Big Cr Near Hays	R	SC541	GO, EL, TR	DO
SS	10260003	Upper Smoky Hill	Smoky Hill R Near Trego	R	SC550	LG, GO, TR	Cd
SS	10260003	Upper Smoky Hill	Smoky Hill R Near Trego	R	SC550	LG, GO, TR	pH
SS	10260010	Lower Saline	Mulberry Cr Near Salina	R	SC640	SA, EW, MP	ECB
SS	10260008	Lower Smoky Hill	Gypsum Cr Near Solomon	R	SC641	SA, MP	DO
SS	10260008	Lower Smoky Hill	Mud Cr Near Abilene	R	SC643	DK	Cl

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Former Impair-ment
SS	10260008	Lower Smoky Hill	Mud Cr Near Abilene	R	SC643	DK	DO
SS	10260008	Lower Smoky Hill	Mud Cr Near Abilene	R	SC643	DK	FCB
SS	10260008	Lower Smoky Hill	Turkey Cr Near Abilene	R	SC644	DK, MN	DO
SS	10260010	Lower Saline	Elkhorn Cr Near Lincoln	R	SC671	LC, EW	FCB
SS	10260010	Lower Saline	Bullfoot Cr Near Lincoln	R	SC672	LC, EW	DO
SS	10260010	Lower Saline	Spillman Cr Near Lincoln	R	SC673	MC, LC	Be
SS	10260010	Lower Saline	Spillman Cr Near Lincoln	R	SC673	MC, LC	Cu
SS	10260010	Lower Saline	Spillman Cr Near Lincoln	R	SC673	MC, LC	ECB
SS	10260010	Lower Saline	Spillman Cr Near Lincoln	R	SC673	MC, LC	FCB
SS	10260010	Lower Saline	Spillman Cr Near Lincoln	R	SC673	MC, LC	Pb
SS	10260006	Middle Smoky Hill	Landon Cr Near Russell	R	SC714	RS, BT	TP
SS	10260007	Big Cr	North Fork Big Cr Near Walker	R	SC715	EL	Ars
SS	10260007	Big Cr	North Fork Big Cr Near Walker	R	SC715	EL	SO4
SS	10260006	Middle Smoky Hill	Sellens Cr Near Russell	R	SC736	RS, BT	Cl
SS	10260006	Middle Smoky Hill	Sellens Cr Near Russell	R	SC736	RS, BT	SO4
UA	11030001	Middle Arkansas-Lake McKinney	Arkansas R	F	NPDES38962	FI	NH3
UA	11030004	Arkansas-Pickerel	Arkansas R Near Dundee	R	SC584	PN, ED, FO	NH3
UA	11030004	Arkansas-Pickerel	Arkansas R Near Dundee	R	SC584	PN, ED, FO	TP
UA	11030004	Arkansas-Pickerel	Arkansas R Near Kinsley	R	SC587	ED, FO	SO4
UA	11030004	Arkansas-Pickerel	Arkansas R Near Ford	R	SC594	GY, FO, HS	B
UA	11030004	Arkansas-Pickerel	Arkansas R Near Ford	R	SC594	GY, FO, HS	DO
UA	11030004	Arkansas-Pickerel	Arkansas R Near Ford	R	SC594	GY, FO, HS	pH
UA	11030004	Arkansas-Pickerel	Arkansas R Near Ford	R	SC594	GY, FO, HS	TSS
UA	11030007	Upper Walnut Cr	Walnut Cr At Ness City	R	SC595	SC, LE, NS	FCB
UA	11030008	Lower Walnut Cr	Walnut Cr Near Heizer	R	SC597	RH, BT	Cu
UA	11030008	Lower Walnut Cr	Walnut Cr Near Heizer	R	SC597	RH, BT	NO23
UA	11030004	Arkansas-Pickerel	Mulberry Cr Near Ford	R	SC700	FO	Pb
UR	10250003	South Fork Republican	South Fork Republican R Near St. Francis	R	SC225	CN	pH

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Former Impair-ment
UR	10250001	Arikaree	Arikaree R Near Haigler, Nebraska	R	SC226	CN	Ars
UR	10250001	Arikaree	Arikaree R Near Haigler, Nebraska	R	SC226	CN	pH
UR	10250001	Arikaree	Arikaree R Near Haigler, Nebraska	R	SC226	CN	SO4
UR	10250003	South Fork Republican	South Fork Republican R Near Benkelman, Nebraska	R	SC227	CN	pH
UR	10250014	Beaver Cr	Beaver Cr At Cedar Bluffs	R	SC228	CN, RA, DC, SH	FCB
UR	10250014	Beaver Cr	Beaver Cr At Cedar Bluffs	R	SC228	CN, RA, DC, SH	pH
UR	10250015	Prairie Dog Cr	Prairie Dog Cr Near Woodruff	R	SC230	PL, NT	ECB
UR	10250015	Prairie Dog Cr	Prairie Dog Cr Near Dellvale	R	SC549	DC, TH	pH
VE	11070102	Fall R	Fall R Lake	L	LM023001	GW	EU
VE	11070106	Caney R	Little Caney R	F	NPDES27481	MG	FCB
VE	11070103	Middle Verdigris	Verdigris R below Independence	F	NPDES42625	MG	NH3
VE	11070103	Middle Verdigris	Drum Cr	F	NPDES45951	MG	NH3
VE	11070103	Middle Verdigris	Drum Cr	F	NPDES45951	MG	FCB
VE	11070103	Middle Verdigris	Lower Verdigris R	F	NPDES50733	MG	NH3
VE	11070103	Middle Verdigris	Lower Verdigris R	F	NPDES50733	MG	ECB
VE	11070106	Caney R	Little Caney R Near Niotaze	R	SC216	CQ, EK	Bio
VE	11070106	Caney R	Caney R Near Elgin	R	SC217	EK, CL, CQ	Bio
VE	11070101	Upper Verdigris	Verdigris R Near Virgil	R	SC289	LY, CS, GW	Bio
VE	11070101	Upper Verdigris	Verdigris R Near Virgil	R	SC289	LY, CS, GW	DO
VE	11070101	Upper Verdigris	West Cr Near Quincy	R	SC290	GW	DO
VE	11070102	Fall R	Fall R Near Climax	R	SC575	GW, BU	DO
VE	11070101	Upper Verdigris	Walnut Cr Near Neal	R	SC576	GW	DO
VE	11070103	Middle Verdigris	Pumpkin Cr Near Coffeyville	R	SC606	LB	Cu
VE	11070103	Middle Verdigris	Big Hill Cr Near Avian	R	SC607	MG, LB	Cu
VE	11070103	Middle Verdigris	Big Hill Cr Near Avian	R	SC607	MG, LB	Pb
VE	11070103	Middle Verdigris	Onion Cr Near Coffeyville	R	SC608	MG	Cu
VE	11070103	Middle Verdigris	Onion Cr Near Coffeyville	R	SC608	MG	ECB

Basin	HUC-8 Code	HUC-8 Name	Waterbody Name	Water-body Type	Station	Counties	Former Impair-ment
VE	11070103	Middle Verdigris	Onion Cr Near Coffeyville	R	SC608	MG	Pb
VE	11070103	Middle Verdigris	Onion Cr Near Coffeyville	R	SC608	MG	Zn
VE	11070104	Elk R	Elk R Near Howard	R	SC693	EK, MG	DO
VE	11070104	Elk R	Elk R Near Howard	R	SC693	EK, MG	Pb
WA	11030018	Lower Walnut R	Timber Cr	F	NPDES00000	CL	NH3
WA	11030017	Upper Walnut R	Walnut R	F	NPDES36676	BU	NH3
WA	11030017	Upper Walnut R	Whitewater R	F	NPDES94561	BU	NH3
WA	11030017	Upper Walnut R	Whitewater R	F	NPDES94561	BU	FCB
WA	11030017	Upper Walnut R	Whitewater R At Towanda	R	SC038	HV, BU, SG	Atr
WA	11030017	Upper Walnut R	Whitewater R At Towanda	R	SC038	HV, BU, SG	SO4
WA	11030018	Lower Walnut R	Walnut R Near Hackney	R	SC532	BU, CL	SO4
WA	11030018	Lower Walnut R	Timber Cr Near Winfield	R	SC653	CL	Cu
WA	11030018	Lower Walnut R	Timber Cr Near Winfield	R	SC653	CL	Pb
WA	11030018	Lower Walnut R	Little Walnut R Near Douglas	R	SC655	BU	Cu
WA	11030018	Lower Walnut R	Little Walnut R Near Douglas	R	SC655	BU	Pb